THE

WESTERN GLEANER,

OR

REPOSITORY FOR ARTS, SCIENCES AND LITERATURE.

VOL. II. FOR JUNE 1814. No. 1.

ON DYEING.

[Continued from page 339 of Vol. I.]

VI. OF DYEING RED.

THE coloring matters, made use of for dyeing red, are kermes, cochineal, archil, madder, carthamus, Brazil-wood, lac, logwood and santal-wood.

Kermes [*coccus ilicis*. Linn.] is an insect found in many parts of Asia and the south of Europe. It lives on a small kind of oak [*quercus coccifera*. Linn.]. If the living insect be bruised, it gives out a red color. Its smell is somewhat pleasant; its taste a little bitter, rough and pungent. When dry, it imparts this smell and taste to water, and also to alcohol, to both which, it gives a deep red color. This color is retained by the extracts made from these infusions.

The introduction of cochineal into dyeing has nearly exploded the use of kermes. The color, however, which it imparts to cloth, is much more durable, as it may be seen in garments two or three hundred years old, which have been dyed with this substance.

To dye upon worsted with kermes, it is first boiled half an hour in water with bran; then two hours in a fresh bath, with one-fifth o f Roman alum, and one-tenth of tartar, to which *sour water* is commonly added; after which, it is taken out, tied up in a linen bag, and carried to a cool place, where it is left some

days. To obtain a full color, as much kermes as equals three-fourths, or even the whole of the weight of the wool, is put into a warm bath, and the wool is put in at the first boiling. As cloth is more dense than wool, either spun or in the fleece, it requires one-fourth less of the salts in boiling, and will produce lighter and paler colors. If we want a succession of shades, we must, as usual, begin with the deepest.

Hellot directs a small handful of cut or refuse wool to be thrown into the boiler in which the kermes is, and to let it boil a moment before the cloth to be dyed is put in. This will absorb a kind of black dregs, and the wool afterwards dipped will take a better color. Before the wool that is just dyed is taken to the river, it may be dipped in a bath of water a little warm, in which a small quantity of soap has been dissolved. In this way the color will acquire more brightness, though it will be rendered a little rosy, that is, will have a crimson cast.

Cochineal is likewise an insect, which is brought from Mexico, where it lives upon different species of the opuntia. Fine cochineal, which has been well dried and properly kept, ought to be of a gray color, inclining to purple. It will keep a long time in a dry place. Hellot says, that he tried some one hundred and thirty years old, and found it produce the same effect as new.

The decoction of cochineal is of a crimson color, inclining to violet. Alum brightens the color of the decoction, and occasions a crimson precipitate. Muriate of tin gives a copious fine red precipitate.

Cochineal is the material most commonly made use of to dye scarlet. The mordant used in that case, is nitro-muriate of tin, which brightens the color of the cochineal. To dye woollen cloth scarlet, it is first boiled in a bath of pure tartar, to which a little cochineal has been added, and then subjected to a second bath of cochineal, which is called the reddening. Sometimes they do not change the bath, but add the reddening to the first bath.

As the red produced by cochineal is rather a crimson than a bright scarlet, to produce the latter it is necessary first to dye the cloth yellow, and after, crimson, as bright scarlet is a com-

pound of crimson and yellow. This is done by the use of fustic, turmeric or quercitron bark, in the first bath, to produce the yellow; the second bath is cochineal alone, which naturally gives a crimson tinge.

When crimson is the color required to be dyed, the tin mordant is the best, but sometimes dyers use alum-baths for this purpose, and then a decoction of cochineal. The addition of archil and potash to the cochineal renders the crimson darker, and gives it more bloom, but this is very fugacious. For paler crimsons, a portion of madder is substituted for part of the cochineal.

Archil is a whitish moss growing upon rocks in the Canary and Cape Verd Islands, which yields a rich purple tincture, very fugacious indeed, but extremely beautiful. For the use of dyers it is ground, moistened with urine, mixed with quicklime, and reduced into the state of a paste. In a few days it acquires a purplish red, at length a blue colour; in the first state it is called archil, in the latter lacmus or litmus. The dyers rarely employ this drug by itself, on account of its dearness and the perishableness of its beauty. The chief use they make of it is for giving a bloom to other colors, as pinks, &c. This is effected by passing the dyed cloth or silk through hot water lightly impregnated with the archil. By the addition of a little solution of tin this drug gives a more durable dye, its color is at the same time changed to a scarlet, and it is the more permanent, in proportion as it recedes from its natural color.

Madder is the root of a well known plant, the *rubia tinctorum*, which, though not a native, grows well in all parts of the United States. The madder prepared for dyeing is distinguished into different sorts: that obtained from the principal roots is called crop-madder: the new crop is that which is produced from the stalks, which, by being buried in the earth, are transformed into roots, and are called layers; each of these kinds are subdivided into fine, ball, bunch and shoot or mull.

The madder of commerce differs likewise, according to the parts of the roots from which it is obtained. All the parts of the madder cannot be pounded with equal facility; the outer bark and ligneous parts are more easily pounded than the pa-

renchymatous parts. Advantage is taken of this circumstance in order to separate these parts, as they do not all give the same color; the outer bark, as well as the wood within, affords a yellowish color, which spoils the red we wish to obtain. This separation establishes the distinction of madder into *robee*, *mirobee* and *courte*.

The coloring principle of madder is equally obtained by infusion in alcohol, and by decoction in water. Wool would receive from this substance only a perishable color, if its coloring particles were not fixed by a base. For this purpose, the woollen stuffs are first boiled for two or three hours with alum and tartar, after which they are left to drain; they are then slightly wrung and put into a linen bag, and carried into a cool place, where they are suffered to remain for some days.

The quantities of alum and tartar as well as their proportions, vary much in different manufactories. Hellot recommends five ounces of alum and one ounce of tartar to each pound of wool; if the proportion of tartar be increased to a certain degree, instead of a red, a deep and durable cinnamon color is produced. Poerner somewhat diminishes the proportion of tartar; he directs that it should be only one-seventh of the alum. Schaeffer, on the contrary, directs that the quantity of tartar should be double that of the alum; but Berthollet found, that by employing one half tartar, the color sensibly bordered more on the cinnamon, than when the proportion was only one-fourth of the alum.

In dyeing with madder, the bath must not be permitted to boil, because that degree of heat would dissolve the fawn colored particles, which are less soluble than the red, and the color would be different from that which we wish to obtain.

When the water is at a degree of heat which the hand can bear, Hellot directs us to throw in half a pound of the best crop-madder for each pound of wool to be dyed, and to stir it well before the wool is put in, which must remain for an hour without boiling; but in order to be more certain of the dye, it may be boiled for four or five minutes toward the end of the operation. Beckman advises the addition of a little alkali to the mad-

der bath. Berthollet approves this plan in the dyeing of thread and cottons.

By this process reds are obtained, which are never so beautiful as those produced even by kermes, much less those from lake and cochineal; but as they cost but little, they are used for common low priced stuffs. The madder reds are sometimes rosed with archil and Brazil-wood, in order to render them more beautiful and more velvety; but the brightness given them in this way is not lasting.

Carthamus is the flower of a plant cultivated in Spain and the Levant. It contains two coloring matters: a yellow, which is soluble in water, and a red, insoluble in water, but soluble in alkaline carbonates. The red coloring matter of carthamus, extracted by carbonate of soda, and precipitated by lemon juice, constitutes the *rouge* employed by ladies as a paint. It is afterwards ground with a certain quantity of talc. The fineness of the talc, and the proportion of it mixed with the carthamus, occasions the difference between the cheaper and dearer kinds of rouge.

The tree that affords *Brazil-wood*, the *cæsalpina crista*, is of the growth of the Brazils in South America, and also of the Isle of France, Japan and elsewhere. If it be boiled in water for a sufficient time, it communicates a fine red color to that fluid. Wool, to be dyed with that substance, must be boiled in a solution of alum, to which one-fourth or even a less quantity of tartar has been added. A larger proportion of tartar would render the color deeper. The impregnated wool is kept at least eight days in a cool place, after which, it is dyed in the decoction of Brazil-wood, by a gentle boiling. As the coloring matter first deposited affords an inferior dye, it is proper to dip a coarser stuff first. In this way a lively red-dye is obtained which resists the air very well.

Lac lake, is the coloring matter of an insect, called by the natives in India, Lacca, precipitated from its solution in an alkaline lixivium, by a solution of alum.

The lac lake manufactured for dyers, is sold under the form of square cakes, of a dull brick color on the outside and of a dark chocolate color in the inside. The fracture is compact,

smooth, and shining; scraped with a knife, the powder is of a red color, inclining to crimson. These are the characteristic marks of good lac lake.

Compared with an equal weight of the best cochineal, the coloring matter of lac lake, *properly dissolved*, is nearly equal in quantity to the coloring matter of the former.

The most proper solvent of lac lake is, refined borate of soda [borax]. Pure crystals of soda will likewise dissolve a considerable portion of it at a boiling heat, but this solution does not afford near so good a color as the other.

To dye scarlet with lac lake, the tin mordant is made use of together with cream of tartar. The most eligible preparations are perhaps, 1 quart of water, 1 drachm of tartar, and one drachm of a saturated solution of tin, to each ounce of the cloth. The boiling ought to be performed during one hour and a half, in a well glazed earthen pan, having a cover and a handle.

In order to prepare the coloring bath, the squares of lac lake should be thrown into a vessel of warm water, and after remaining a short time, well brushed with a clean brush, kept for the purpose, in order to clean it of any dust adhering to the surface, rinsing them out afterwards in fresh water. The lake is then to be reduced to a very fine powder in a mortar, and passed through a sieve; the finer the powder, the more easily and more completely will the color dissolve.

An equal weight of refined borax, is next to be powdered separately, but not sifted, and the powdered lake returned into the mortar upon the borax, working the pestle, till they are well mixed with each other.

Though the quantity of coloring matter in the same weight of different kinds of lac lake, be not always the same, we may yet, on the supposition that we are operating with such as possess the characteristic marks formerly described, establish the following proportions: 1 quart of water, 1 drachm of lake, and 1 drachm of borax, in the state of a mixed powder, to 1 ounce of cloth.—The proportion of the mixed powder necessary for the cloth to be dyed is put into a vessel, and half the quantity of water mentioned above (previously heated to the boiling point) poured upon it. When all the water is poured in, it

should be stirred well about a minute, the lid put on, and covered with thick cloths to retain the steam and heat. It should be left to rest and digest for fifteen minutes and then stirred, covered up for fifteen minutes more, and then stirred again. After this, it should remain undisturbed for half an hour at least, to let the grounds settle to the bottom, before it is drawn off into the boiler.

The remaining half of the water required for this bath, is to be put into the boiler, and when a little more than warm, the solution of lac lake is to be poured in. When the bath is nearly boiling, a quantity of solution of tin, equal in weight to the mixed powder, or twice the weight of the lac lake is added, stirring the bath gently. When it begins to boil, the cloth must be put in, moving it at first very quickly by means of the roller, until the cloth has run its whole extent backwards and forwards several times, after which it may be moved more slowly. Having boiled for a quarter of an hour, the cloth is either to be lifted out and placed on the scraw, or wound rapidly on the roller. A quantity of cream of tartar in very fine powder, one-fourth the weight of the lac lake, is then to be added to the bath, stirring it briskly. In five minutes from the time it was taken out, the cloth must be returned into the bath, and moved again quickly for a few turns, and afterwards more slowly. It must now be kept boiling moderately for more than one hour, making the whole time it has boiled one hour and a half, a little longer or a little shorter, according to the depth of color required.

The scarlet color produced in this manner on wool, is equal to that of the finest cochineal, with the important advantages of being much cheaper and more permanent.

Logwood, India, Jamaica, or Campeachy-wood, has received these names from the places where it grows most plentifully. The tree is called by Linnæus, Hæma toxylum campechianum. It gives out its coloring matter, copiously to alcohol, and more sparingly to water. For use, its juice, as it is called, may be extracted by decoction with water. The color of its dyes is a fine red, inclining a little to violet or purple. Stuffs would take

only a slight and fading color from decoction of logwood, if they were not previously prepared with alum and tartar. A little alum is also added to the bath. By these means they acquire a pretty good violet.

Juice of logwood is frequently mixed with that of Brazil, to render colors deeper; their proportion being varied according to the shade desired.

Santal-wood or *red sanders*, is the ligneous part of the tree called by botanists *Stericarpus santalinus*. It yields its coloring matter, which is of a very lively red, especially to alcohol. To form the tincture, four grains of red santal-wood are reduced to a very fine powder, dissolved in twelve ounces of strong spirit, and exposed to a gentle heat. In the space of 48 hours, it will be found that the spirit has extracted all the coloring part of the santal-wood: but while it is digesting, care must be taken, from time to time, to shake the vessel which contains it.—The dye prepared in this manner, may be employed when cold, to dye stuffs, even without being filtered; for the stuffs digested in it for an hour or two, will be found to have extracted all the coloring matter.

The addition of six or seven times the same quantity of water to the spirituous tincture of santal wood, will not prevent the effect of the dye. In this manner an aqueous liquor is obtained, which forms the proper coloring bath. The solution of tin, used as a mordant, furnishes with this substance a lively red color; alum, a beautiful and brilliant scarlet; sulphate of copper, [blue vitriol] a beautiful crimson; sulphate of zink, [white vitriol] a deep crimson; and sulphate of iron, [green vitriol] a dark red.

Stuffs or cloths must not be digested longer than 48 hours in the spirituous liquor above mentioned, or in the diluted tincture. As soon as the stuffs are taken from the liquor, and squeezed or wrung, they ought to be digested in a cold solution of a small quantity of alum and marine salt. Great care must be taken to wash them afterwards in cold water, which renders the color more solid and more durable. Stuffs dyed after this method, resist wonderfully the action of alkalies and of acids.

Among our native plants which may be substituted to foreign materials for dyeing red, we have particularly to notice the *galium tinctorium*, or *dyer's lady's bed-straw*, which grows in many parts of the United States, in places sheltered from the sun, and where the ground is rather moist. This plant so nearly resembles the madder [rubia tinctorum] in its botanical character, as well as in its coloring properties, that some writers have given it the name of Rubia Americana The galium is employed by the inhabitants of Jura, one of the Hebrides, as a red-dye and is perhaps equal to the rich red of the Rubia itself.

We learn from the Aurora, that the juice of the common Pokeberry [phytolacca decandra] has lately been added to the list of our national permanent red dyes. Dr. Adam Seybert, of Philadelphia, was the first who succeeded in fixing this color, which can be changed from the brightest crimson, to a red, little inferior to scarlet. The process of Dr. Seybert, however, has not yet been published.

In several parts of Europe very beautiful red colors are extracted from various kinds of mosses, in common with other substances. As our country abounds in plants of this species, we may expect that future inquirers will discover among them valuable additions to our American dye-stuffs.

Silk is usually dyed red with cochineal or carthamus, and sometimes with Brazil-wood. Kermes does not answer for silk; madder is scarcely ever used for that purpose, because it does not yield a color bright enough. Archil is employed to give silk a bloom; but it is scarcely used by itself, unless when the color wanted is lilac.

Silk may be dyed crimson by steeping it in a solution of alum, and then dyeing it in the usual way in a cochineal bath.

The colors known by the names of poppy, cherry, rose, and flesh-color, are given to silk by means of carthamus. The process consists merely in keeping the silk, as long as it extracts any color, in an alkaline solution of carthamus, into which as much lemon-juice as gives it a fine cherry color, has been poured.

Silk cannot be dyed a full scarlet, but a color approaching to scarlet may be given it, by first impregnating the stuff with

murio-sulphate of tin, and afterwards dyeing it in a bath, composed of four parts of cochineal, and four parts of quercitron bark. To give the color more body, both the mordant and the dye may be repeated. A color approaching scarlet may be also given to silk, by first dyeing it crimson, then dyeing it with carthamus, and lastly, yellow without heat.

Cotton and linen are dyed red with madder. This process was borrowed from the east. Hence, the color is often called Adrianople, or Turkey red. The following process for producing this color, is extracted from the Archives of Useful Knowledge.

First—Make a ley of one part of good potash, dissolved in four parts of boiling water. Then slack half a part of lime in it. Next dissolve one part of powdered alum in two parts boiling water, and while this last solution is warm, pour the ley gradually into it, stirring and mixing them both together. Then add to the above mixture a thirty-third part of linseed oil, which, when well mixed with it, will form a rich milky substance, resembling cream. As the skeins of cotton are dipt into this mixture, it must be stirred, as the oil will rise to the top of it when it is at rest.

The above ingredients make what is chemically called, "Alkaline solution of alumine, mixed with oil;" which, in speaking of hereafter, I shall call the *alkaline mixture.*

The quantity of the alkaline mixture to be made, must be determined by the quantity of cotton intended to be dyed. And to ascertain the respective parts of the different ingredients as named above, they must all be weighed; beginning with water first, of which there must be enough to permit each skein of cotton to be immersed in it.

Before the cotton (or flaxen thread, when that is to be dyed) is dipt into the alkaline mixture, it must be first well bleached and cleaned by washing, of every foreign extraneous substance; then boiled in strong ley made of potash, and dipt into the alkaline mixture whilst it is hot, and as wet as it will be when the ley is well gotten out of it by drawing the skeins through the hands. The skeins are to be immersed into the alkaline mixture, one after another, and to be repeatedly dipt and gently drawn through the hand, until they become well soaked.

As each skein undergoes the above process it is to be put upon a pole, in the shade, to dry; in summer they are to be put out of doors where they are protected from the rain, and in the winter to be kept in a warm place, within doors. After remaining in that state for twenty-four hours, they must be well washed in pure running or rain water and again dried.—After which, they are to be washed in a strong ley, made of good hickory ashes (or better of potash) one skein after another, and gently and equally pressed, by drawing through the hand or a pair of smooth wooden rollers, and again hung up to dry.

The madder is now to be used—after fixing upon the quantity (which will be regulated by the deepness of the color intended to be produced, of which more will be said presently) it must be put in as much clean rain water, as will completely and entirely cover the whole of the cotton. Then add thereto of pounded chalk (which must by no means be omitted) a fourth of the weight of the madder used. It must now be put over a slow fire, and kept for about three hours, at a state of heat, something less than boiling, or in such a state that hardy persons can put their hands into it without being scalded. During this part of the process, the skeins are to be frequently shifted and changed, that every part of them may imbibe the coloring matter. From this the cotton is taken and dried, and then washed in a large quantity of water to cleanse it. The finishing part of the process, called clearing, now follows, which consists in boiling the cotton for eight hours in water, containing a bag filled with bran. The water is to be kept in a brisk state of boiling the whole time, and as it evaporates, boiling water is to be added. The water ought also to be boiling when the cotton is put into it. The deepness or intensity of the color, in this mode of dyeing, will be regulated by the number of times the cotton is dipt into the alkaline mixture and the quantity of madder used. To give the different shades of red, the cotton may receive two, three, or four immersions, and a quantity of madder equal to once, twice, three, or four times the weight of the cotton. If dipt more than once, fresh alkaline mixture must be made each time, as it loses its qualities by standing. And the same process of drying, washing in water and ley, as above de-

scribed, must be observed and strictly attended to after each dipping into the alkaline mixture.

When flaxen thread is intended to be dyed, the same process in all its parts must be used as above described for cotton.

To enable our readers still better to apply practically this somewhat complicated process, we shall transcribe the very valuable description given of it by Mr. Haussman.*

"After making a caustic ley of one part of good common potash dissolved in four parts of boiling water, and half a part of quicklime, which I afterwards slacked in it, I dissolved one part of powdered alum in two parts of boiling water; and while this solution of sulphate of alumine was still warm, to avoid re-crystallization. I speedily poured into it successively, always stirring it without interruption, the above mentioned caustic ley, till the alumine it had at first precipitated after saturation to excess with sulphuric acid, had been redissolved. I left at rest this solution of alumine, which exhaled ammonia, and which on cooling, formed a precipitate of sulphate of potash in very small crystals. I then mixed a thirty-third part of linseed-oil, with which the alkaline solution of alumine formed a kind of milky liquid. As the oil gradually separates itself from this mixture under the appearance of cream, it must not be employed till it is again shaken. The skeins of cotton or linen ought to be successively immersed in it, and equally pressed, that they may be then exposed to dry on a pole in the order in which they have been taken from the mixture. They must be dried under shelter from rain in summer, and in a warm place in winter, and be left in that state for twenty-four hours: they must then be washed in very pure running water, and be again dried; after which they are to be immersed in an alkaline ley, pressed and dried a second time in the same manner as the first, taking care, however, to recommence the immersion in the ley with those skeins which have been last in the oily mixture, because the first never fail to carry away a larger portion than the last: it will be proper also to consume the mixture each time, that it may

* Tilloch's philosophical Magazine, Vol. XII. From the annales de Chimie. p. 123.

not have leisure to attract the carbonic acid with which the lower region of the atmosphere is always charged, especially in manufactories; for the alkali, by passing to the state of carbonate, suffers the alumine to be precipitated, and loses the property of mixing with the oil.

"Two immersions in the alkaline solution of alumine mixed with linseed-oil, will be sufficient to obtain a beautiful red; but, by continuing to impregnate the skeins a third and even a fourth time with the same circumstances as the first, colors exceedingly brilliant will be produced.

"The intensity of the red proposed to be obtained will be in proportion to the quantity of the madder employed. By taking a quantity of madder equal in weight to that of the skeins, the result will be a red, which, by clearing, will be changed to a rosy shade: on the other hand, shades of crimson, more or less bright, will be obtained by employing two, three, and even four times the weight madder, without ever forgetting the addition of chalk, if the water employed does not contain some of it. Four parts of this coloring substance will produce a red too intense and beautiful to be employed in commerce, as it would be too dear to find purchasers.

"By making an oily alkaline solution of alumine with two or three parts of water, and impregnating the skeins twice, and even four times, in the manner above mentioned, bright shades will be produced without the use of much madder; but they will not have the same intensity as those procured with even as little madder by means of the same solution concentrated.

"The best method of obtaining shades lively as well as bright, is to expose the dark reds for a considerable time, when they have been cleared, to the action of a ley of oxygenated muriate of potash, or of soda, with excess of alkaline carbonate, in order to have such a degree of shade as may be required: but it may readily be conceived that this method would be expensive.

"To have the oily alkaline solution of alum nearly in the same state of concentration, it will be necessary to employ an aerometer to determine the degree of strength of the caustic ley before it is employed for the solution of the alumine. This

caustic ley must be made with the best common potash that can be procured, and the degree it gives by the aerometer must be noted, in order that, if potash of an inferior quality be afterwards employed, the ley obtained may be carried to the fixed degree by evaporation.

"Caustic ley made with four parts of good common potash cannot contain a large quantity of foreign salts. By making it on a large scale, when the limpid part has been decanted, it will be necessary to shake the deposit, for some time, twice every day, that the rest of the alkaline liquor may be decanted; and that none of what still remains in the deposit may be lost, it ought to be diluted with more water, which may be afterwards employed to lixiviate the cotton, which must be well purified and cleaned before it is dyed; which may be done by lixiviating and soaping, or merely boiling it in water, and then rinsing and drying it. As wringing with the hands may derange the filaments of the skeins of cotton and linen, and consequently weaken the thread, it will be proper, in operating on a large scale, to squeeze them by means of a press.

"In regard to thread or linen to be dyed of a beautiful dark and fixed red, it must be well bleached, and impregnated at least four times successively with the oily alkaline solution; because, not only alumine and metallic oxides adhere with more difficulty to linen than to cotton, but because these mineral substances, when colored, abandon linen much easier than cotton when clearing. It still remains to examine whether, between each impregnation with the oily alkaline solution of alumine, cotton or linen thread requires to be left at rest for a greater or shorter time before it is rinsed and dried.

"All fat oils may be employed in the mixture with proper precautions; but linseed-oil mixes better, and remains longer suspended in the alkaline solution of alumine: I never tried fish-oil, which, perhaps, would be preferable. It is probable also, that in operating on a large scale, it would be best to diminish the quantity of linseed-oil in the mixtures with the alkaline solution of alumine; for I have had reason often to observe that too much oil hurts the attraction of the coloring parts of the madder: a thirty-third part of linseed oil always produced the best effects in my trials on a small scale.

"In regard to the process of dyeing cotton and linen thread, sufficiently charged with alumine, by the oily alkaline solution of that earth, the skeins must first be disengaged from every saline substance as well as from the superfluous oil, by rinsing them a long time in very pure running water; after which, they must be arranged without drying them, on an apparatus, which the operator may construct according to the form of the boiler, in which it is to be placed in such a manner, that during the process of dyeing, the skeins may be continually shaken and turned, in order to catch every where, and in an uniform manner, the coloring particles. The bath must be composed of madder, mixed with a sixth of pounded chalk, and diluted with about 30 or 40 parts of water. The heat must be carried only to such a degree that the hand can be held in the bath for an hour without being scalded, and is to be maintained at this degree for two hours, either diminishing or increasing the fuel. Three hours dyeing will be sufficient to exhaust the madder: the skeins when taken from the bath must be washed in a large quantity of water to cleanse them; they are then to be cleared by boiling them a pretty long time in water containing bran inclosed in a bag, adding soap, and alkaline carbonate, to give the red a rosy or carmine shade.

"As I never had occasion to dye cotton or linen thread on a large scale, I employed a small boiler, which served me at the same time for the process of clearing: in the latter operation I confined myself to boiling the skeins, properly arranged, in water containing a bag filled with bran, for eight hours successively; and, that I might not interrupt the ebullition, I replaced the evaporated part by the addition of more boiling water. In this clearing I employed neither soap nor alkali, yet I obtained a red superior in beauty and fixity to that of the Levant, and which, in every respect, will bear a comparison with the best colors dyed in France.

"For dyeing my red, I employed three parts of the best madder for one part in weight of dry cotton thread.

"With the precaution I took to obtain an uniform shade I could have dyed at one time, but I should always recommend

performing this operation at two different times, taking each time half a portion of madder and of chalk, if the skeins cannot be continually turned in the boiler: it may serve also for clearing, by adapting to it a cover so as to suffer very little of the vapors to escape, because it would be too expensive to replace the part evaporated by more boiling water. By operating on a large scale, and concentrating the heat in the boilers, keeping them almost close, there, perhaps, would be no need of employing eight hours ebullition to clear and fix the colors. I have every reason to believe that this clearing of the Turkey red gave rise to the idea of bleaching with steam: it must have been seen that colors by being cleared lose considerably in regard to their intensity; and perhaps it has been observed at the same time that the packthreads employed for arranging the skeins were bleached during the clearing, especially when alkalies were added.

"A great variety of colors and of different shades may be obtained by following the process here described for obtaining the beautiful and durable reds. In this case, the oily alkaline solution of alumine must not be employed till the required shade of oxide of iron or indigo blue has been given; but whatever may be the color or shade which you wish to give, before you fix the alumine on the skeins of cotton or linen, these skeins must always be first well boiled, by which means the adhesion of the indigo fecula, as well as that of the oxide of iron will be increased, in the same manner as that of alumine colored by the coloring parts of madder when subjected to the action of the heat of boiling water before they are impregnated with the oily alkaline solution of alumine. As the method of dyeing indigo blue in all its shades, is well hnown, it is needless to detail it; and as to giving a rusty yellow color, which may be done at little expense, nothing is necessary but to moisten the skeins well with a solution of the sulphate of iron, to press them equally, and then to immerse them in a caustic ley of potash, which will precipitate and fix the oxide of iron of a disagreeable color, but which will not fail to assume a rusty yellow shade by attracting and becoming saturated with the oxygen of the atmosphere: thus, yellow will be more or less dark, accord-

ing to the quantity of the sulphate of iron in solution. More intensity and even more equality may be given to the rusty yellow by moistening the skeins a second time in the ferruginous solution and immersing them in the caustic ley. Care, however, must be taken not to use soda for this operation, because it generally contains sulphur, which blackens oxide of iron by mineralizing it.

(To be continued.)

ON SALT AND SALT-MAKING.

THE important article, known under the name of common salt, [muriate of soda] is among those mineral productions which are of a very extensive use in the arts, and it is at the same time the only one material of this kind which forms a necessary ingredient in our food. It crystallizes in cubes, which are sometimes grouped together in various ways, and not unfrequently form hollow quadrangular pyramids. In the fire it decrepitates, melts, and is at length volatilized without undergoing decomposition. When pure, it is not deliquescent. One part is soluble in $2\frac{1}{2}$ of cold water, and in little less of hot, so that it cannot be crystallized by mere cooling, but only by evaporation. According to Mr. Chenevix it is soluble in alcohol also, particularly when it is mixed with the hyperoxymuriate. It is composed, according to Kirwan, of 53 per cent. of soda, and 47 muriatic acid and water, and the quantity of real acid is such, that 100 parts of the crystallized salt decomposed by nitrat of silver, will give $233\frac{1}{2}$ of hornsilver, luna cornea, [muriate of silver] of which the mere acid is 38. 6. It must be observed, that there is some difference in the analysis of different chemists, but taking the above data as correct, 100 parts of crystallized muriate of soda will contain 53 of soda, 38. 6 of acid, and 8. 4 of water. These are the chemical characters of common salt; but we think it more particularly interesting for our readers in the western country, to impart to them some details concerning the natural history of this article, and the various methods followed in manufacturing it for commerce.

I. NATURAL HISTORY OF COMMON SALT.

Common salt exists abundantly native, either as a solid fossil, or dissolved in water. In the former case it ranks as a peculiar mineral species of which there are the two following varieties:

Var. 1. Foliated rock-salt.
Var. 2. Fibrous rock-salt.

Rock-salt forms a peculiar species of rock, the proper geological situation of which is between the oldest secondary gypsum and secondary sandstone: it forms continuing beds of great thickness, and often occurs in large solitary blocks: it is always accompanied by semi-indurated clay, for the most part strongly impregnated with salt, and alternates with beds of swinestone, gypsum, limestone, and sandstone. The beds of salt are mostly below the surface of the ground, but sometimes it rises into hills of considerable elevation. At Cordova in Spain, there is a hill between four and five hundred feet high, composed entirely of this mineral. The salt rock supposed to exist near the Arkansas in Louisiana, has been discredited by the testimony of recent travellers.

Mines of sal gem and brine-springs, which derive from them their existence, are abundant in nearly every part of the world. Spain possesses a considerable number of them. The mine at Cardonna, in Catalonia, near the mountain of Montserrat, is remarkable for this, that the salt forms a homogeneous mass, without any appearance of stratum or crevice, raised about a hundred and eighty yards above the earth, and extending about three miles in circumference. Neither the depth of this heap of salt, nor the nature of the ground on which it rests, are known. The salt composing it, is white, or red, or light blue, and is not accompanied with sulphat of lime, which is a rare occurrence.

The mine of Valtiena, in the kingdom of Navarre, near the province of Ebro, is in a chain of hills at a considerable elevation above thelevel of the sea. It is enclosed in sulphat of lime.

In the province of Mancha, at Almengranilla, there is a mass of salt similar to that of Cardonna. It is seventy yards in diameter,

mixed with sulphate of lime, and covered with the same stone, including crystals of red quartz, above which are siliceous pudding stones, and a stratum of carbonate of lime.

The mines of sal gem, that are wrought at Poza near Burgos, in Castilla, have a remarkable situation, being placed in a vast crater. Mr. Fernandez has found pumice stones, puzzolana and other volcanic productions there. No mine of sal gem has yet been found in *France*, but there are a tolerable number of brine-springs.

The only mines of rock-salt in *England*, are those in the neighborhood of Northwich in Cheshire. These were discovered in 1760. The first stratum of salt occurs at the depth of about forty yards. The strata vary in thickness, are of a wavy structure, and alternate with strata of clay, under which they are found. The salt is in some places red, in others transparent. The ground over them consists of strata of red clay, coarse-grained sandstone, blue-clay, sulphate of lime, and indurated clay. These mines are the most productive of any in the world. The salt is worked by running galleries into the strata and leaving pillars of it to support the roof, symmetrically arranged, which give the whole a beautiful appearance. It appears to be free from sulphate of lime. The quantity of rock-salt obtained from the mines of Northwich is greatly superior to that obtained from the celebrated mines of Wielicska in Poland.—The bishop of Landaff affirms, that a single pit, into which he descended, yielded at a medium, 4000 tons of salt in a year, which alone is about two-thirds of that raised in the Polish mines. This rock-salt is never used on the English tables, as the Polish rock-salt is, and though the pure transparent salt might be used with common food, without any danger, yet it is prohibited under a penalty of 40*s*. for every pound of rock-salt so applied: it is partly purified in water, and a great portion of it is sent coastwise to Liverpool and other places, where it is used either for strengthening brine-springs or sea-water.

Germany abounds in salt, particularly in the dissolved state, or brine-springs. These occur almost every where, from Westphalia and the shores of the Baltic, through Pomerania,

into Suabia and Austria. About sixty are mentioned, which supply the general consumption throughout Germany.

In *Switzerland* the brine-springs of Bex, in the canton of Berne, are celebrated for the beauty of the subterraneous works that have been executed in search of these deep sources, and to bring them to the surface. The soil in which they are found, is a schistous marl, containing some slender veins of sal gem. It appears to include large blocks of carbonate of lime, and to be itself enchased as it were, in beds of sulphate of lime, rendered impure by a brown clay. The surrounding soil is covered with the same sulphate of lime as occurs in the subterraneous excavations. Sulphur has been found in the carbonate of lime. These brine-springs require *graduation*, a process hereafter to be described.

In *Italy*, brine-springs are mentioned in several places.

It appears from the preceding account, that the majority of brine-springs and mines of rock-salt are found at the foot of high mountainous chains. The mines of Transylvania, Upper Hungary, Moldavia and Poland, are further proofs of this general principle. These mines, which are very numerous, and important with regard to their extent, the vast bodies of salt which they contain, and their product, are found along the chain of the Carpathian mountains, and spread nearly in an equal degree to each side of the chain. They accompany these mountains to the extent of more than two hundred leagues from Wielicska in Poland, towards the north, to Poksżian, or Rymnick, in Moldavia, to the south.

The strip of land that contains the salt mines, or brine-springs is near forty leagues broad in some parts. In it may be reckoned about sixteen mines, that are worked for salt; forty-three indications of mines that have never been wrought; and four hundred and twenty or four hundred and thirty brine-springs.

The most remarkable of these are, beginning in the north-east and proceeding in a southerly direction, those of Wielicska, Bochnia and Samber, in Poland; and some brine-springs in Buchowine and Moldavia, particularly near Ockna. On the south-west of the chain, following the same direction, are these

of Sowar, near Eperies, in Upper Hungary; of Marmarasch in Hungary, of Dee, Torda, Paraid and Visarkna, near Hermanstadt, in Transylvania, &c.

The salt mines of Wielicska, near Cracow, and those of Bochnia, which appear to be a branch of them, are celebrated from the accounts given of them, by almost every traveller in that country, many of whom have represented them in too strong colors. We shall subjoin the description given of them by Mr. Guettard, a member of the royal academy of sciences of Paris.

"The salt mines of Wielicska are under a mountain on which is built the city which gives them its name. There is a descent to those mines by nine wells; and here the salt is drawn out, and the laborers ascend and descend by the help of cable, about which is twisted a rope, forming a sort of stirrup-girth, whereon they sit. One may also go down by ladders placed along the sides of the wells. Those who have not a mind to expose themselves to the danger of going down in this manner, may make use of stairs, very well built, of stone and brick, and about 300 toises from one of the wells. These stairs have 470 steps, and it was by that M. Guettard descended. These mines are nothing different from those commonly met with, except that the air is much wholesomer in them. The banks of salt lie at a pretty considerable depth, and, after piercing a considerable thickness of ground, the first layer or stratum, is entirely of the same sand whereof a great part of the soil of Poland is composed; underneath are several strata of clay, somewhat different in color, and more or less mixed with sand and gravel; some of them have none, and the miners call them halda-midlarka, or soapy earth. Some of these strata of earth are disseminated with marine bodies, particularly shells, which are almost all of a small size. Being come to a certain depth, the strata of earth are separated by lamina, or plates of stone, which their little thickness has made to be considered as slates, but which are real calcareous stones, having nothing common with slate, but by being thin and in plates. From space to space, are also found blocks of stone of an iron gray color. The Count de Schober, who wrote minutely of those mines, assures us of having seen some strata of earth separated by a kind of

alabaster; but M. Guettard did not see any of this sort. The last beds of clay are also separated by a still more singular substance, which is a kind of plaster. This stone, at first sight, represents a collection of teeth of some animal, converted, as it were, into plaster; but the extent of those strata does not allow of such a conjecture to be adopted. An idea may be had of this substance by imagining a soft paste, drawn out and twisted into long handles, holding to, and sometimes several of them lying upon one another. So soon as the miners have perceived this stone, they are sure of soon finding the banks of salt, which they do effectually. All the materials that form the different strata just mentioned are not always ranged horizontally; those strata rise and sink frequently, but it is not till they have been all pierced that the miners arrive at the real banks of salt, which lie commonly at the depth of 300 feet. Some salt, however, is met with in the last strata of clay, and formerly this clay was washed to extract it by evaporation; but the scarcity of wood has occasioned this work to be discontinued; yet the pieces that are found large and transparent enough are employed for some small works in imitation of crystal. Immediately under the strata of clay are found banks of salt, but of little extent and thickness, and even frequently blocks of salt standing alone, and placed obliquely in the clay; but immediately after the real banks of salt are met with. The extent of those banks is absolutely unknown. Galleries have been pierced therein of 800 or 900 feet, without finding the end. The same uncertainty takes place in regard to their thickness, for it greatly varies; but it is certain that excavations thirty or forty feet high, are found in these mines, which had been dug into one and the same mass of salt, without reaching out of it. This enormous mass has an inclination of about 45 degrees, but does not every where follow this direction, being sometimes horizontal, and sometimes according to the contours of different mountains under which it extends. The substance of this salt is pretty hard, and its color of a clear gray, or pretty fair white; it is commonly opaque; but some pieces are found more or less transparent, and when examined attentively by a good glass, are seen entirely composed of small cubes, the figure as it is known which is affected

by sea salt in its crystallization; it therefore resumes the same figure when, after being dissolved in water, it is crystallized anew; and the waters which sometimes appear in rooms or places that have been neglected or abandoned, form there at length, masses of salt, wherein is found the same texture. Sometimes, in the midst of masses of the whitest salt, are found considerable parts of a more or less blackish substance, which appears to be rotten wood. This wood exposed to the flame of a candle, catches fire easily, and is as easily extinguished, leaving a smell of rancid oil. M. Guettard has been assured, that the pyrites have been sometimes in this salt, which is not surprising, the clays found in and about the salt being sufficient to produce it.

"The inclination of the banks of salt to the horizon, which according to M. Guettard's observations, proceeds to about 45 degrees, obliges the miners to form different stages in the excavations of the mines; the galleries even stoop towards the bottom of the mines, terminating in pretty spacious yards, crossways or chambers, in which are now left some pillars for securing the vault, and prevent any falling in, which the want of this precaution, and the enormous weight those vaults are loaded with, sometimes occasion. It is in some of the more distant chambers, that the wells are pierced which have a communication from one stage of the mine to another; and it is through these wells, by the means of axle-trees, wound round with cables and drawn by horses, that enormous masses of salt are raised from the lower stages, and, after being rolled into the galleries, are lifted up, through the wells, to the surface of the ground. These horses, of which now, within these few years, a numerous breed has been kept up, in order to spare the men in the hardest and most laborions parts of the work, never go out of the mines, at least as long as they are in a condition for service; and commodious stables have been dug for them in the mass of salt. The water oozing from the earth, and found commonly at the beginning of the mine, is taken care of, and conveyed properly to serve them for drink. In or near the same yards, or crossways, where the above-mentioned wells are, stairs have been made, which have a communication from one stage to ano-

ther. In going down those stairs, as well as going through the inclined galleries which lead from one crossway to another, openings to the right and left of several other galleries are met with, all leading to other works of the mine. No inconveniency is felt therein; the air is pure and wholesome; all parts are kept very clean; and the only disagreeable thing is the dust which is sometimes raised by the working of the mine and the horses' hoofs. It must not, however, be forgot, that there is sometimes a serious accident occasioned by the sudden explosion of an inflammable vapor, which, collecting in some parts, especially in the deserted rooms, and catching fire from the lighted candles the laborers are obliged to carry about with them, puts them in danger of their life by the violence of the explosion: but, happily, those accidents are not very frequent. The Polish piety has even gone so far as to form chapels in those subterraneous abodes, where mass is celebrated on certain days of the year. The greatest and largest of these chapels is that which is dedicated to St. Anthony; it is thirty feet in length, twenty-four in breadth, and eighteen in height. The altar, the twisted pillars that serve as ornaments to it and the sanctuary, the other pillars that sustain the vault, the crucifix, and the other ornaments of the altar, with the figures of angels, those of St. Francis, St. Anthony, and Sigismund King of Poland, are all of salt; so that this place alone is a singular rarity, and the sight of it may well compensate the trouble of descending to those subterraneous regions. Those who work at these mines remain there only about eight hours, at the expiration of which time they come up, and are relieved by others. The hard labor required for hewing out the blocks of salt, and other purposes, would not permit them to continue there longer. It is computed that, one year with another, between twelve and thirteen million pounds of salt are taken out of these mines, which are sold in Poland and some neighboring countries, when 20,000 tons of it have been sent to the nobility of Great and Little Poland."

The mines on the south-east of the Carpathian chain, appear more numerous, and are disposed through a greater space of ground, than those of the north-east. They are in general

very near the surface. Some of those in Transylvania, are so to such a degree, that persons are appointed to cover the salt with turf, when it is washed bare by the rain. These masses, however, are so thick that their bottom has never been found. If they be not worked to the depth of an hundred and seventy or eighty yards, it is because the extraction of the salt becomes too expensive. In the county of Maramarsh, they have been wrought to the depth of upwards of two hundred yards. These mines contain likewise a great deal of petroleum; and the ground in which they are contained, is every where surrounded by rivers. The mud, interposed between the water of these and the salts, is imagined to prevent the salt from being dissolved by them.

At Paraid, in Transylvania, there is a valley, the bottom and sides of which are of pure salt; walls of salt appear 60 or 70 yards high.

In the salt mines of Maramarsh, water has been found included in the substance of the salt-rock.

The mines on the south-west of the Carpathian mountains are generally wrought by shafts. There are at least two to each mine; one for the workmen, the other for drawing up the salt. The salt is cut out in ascending steps, which produce empty spaces of a conical form, in the midst of the strata. The ladders reach perpendicularly to the bottom of this conical space, so that within it they stand perfectly detached. Thus, the greater part of the body of salt is extracted, leaving empty spaces which are conical, and which communicate with one another, by means of galleries. It has been thought, that, in order to leave less salt, it would be better to give these spaces the shape of a parabola, or rather an even square, with vertical walls meeting together, in the form of an ogee. The salt is so plentiful, that the miners are paid only for such pieces as weigh upwards of eighty pounds, the others being rejected as useless. When the workmen are incommoded by water, it is drawn up in leathern bags, to be emptied out of the mine.

We shall not prosecute any further this geographical delineation of the principal salt-mines that are known, but content

ourselves with terminating this sketch with a short account of our national resources in this line.

The most numerous and best salines of North America seem to be situated in Louisiana. The tract which contains them lies immediately behind the tract of lead ore, and runs parallel with it. The number of salines on the Arkansas and the Osage, are surprising. The water of the Arkansas itself, is brackish, and travellers, accordingly, are obliged to provide themselves from such streams and springs of fresh water, as flow into it. Near the place where this tract crosses the Arkansas, several streams enter it which are strongly impregnated with salt; among others, the Big Saline, and the Strong Saline, both nearly one hundred yards in width. It is here that the famous salt-rock was said to be found, and that salt prairies are known to exist. The party of captains Lewis and Clarke, when traversing this tract, found in many places the ground covered with an incrustation of salt. The color is of the purest white; there is usually a mixture of gypsum and some pieces are penetrated with sparry matter, probably crystals of Selenite. Considerable portions of salt are also scattered over the prairies, in a pulverised state, resembling sand; the Indians gather it with the wing of a turkey.

The salt springs of Onondaiga and Cayuga, in the state of New York, furnish about 300,000 bushels a year; and the quantity may be increased in proportion to the demand. Those of the western states and territories, supply about an equal quantity. The salines on the Kenhawa, are highly important, and their produce forms a very essential article of commerce on the waters of the Ohio. The Wabash saline, which belongs to the United States, is making now yearly, about 130,000 bushels.—Salt has also been obtained in this country by the evaporation of sea-water, after several of the European methods. The importation of foreign salt, nevertheless, has not yet entirely ceased.

(To be continued.)

APHORISMS OF POLITICAL ECONOMY.

(Continued from p. 349, of Vol. I.)

CHAPTER IV.

ON THE RECIPROCAL DEPENDENCY OF THE VARIOUS CLASSES OF SOCIETY FOR THEIR ANNUAL REVENUE.

¶ 99. The population of an agricultural people may be divided into two principal and distinct classes, viz. the laboring class, and the class of independent consumers. The first of these classes contains the cultivators of the soil and the manufacturers, and the second the magistrates, together with all those who maintain themselves without exercising any productive labor.

¶ 100. The class of independent consumers contains so many different persons, that it will be necessary to distinguish them further in a more peculiar manner. Two principal distinctions occur in this respect: 1, That species which is composed of the magistrates and the public officers, and which we will call the *essential species* of independent consumers, because the good order and tranquillity of every political society rests principally on them:

2. All the other members of the society, who, without being either cultivators of the soil, or manufacturers, or magistrates, are indebted for their maintenance only to the introduction of the precious metals under the form of money, and whom, on that account, we shall call the *accidental species* of independent consumers.

¶ 101. The accidental species of independent consumers contains, finally, two subspecies, which it may be useful to distinguish:

1. The owners of land, of mines, of fisheries, &c. who have abandoned to others the enjoyment of their property, under the reserve of an annual retribution, or, as it is commonly called, of a *rent*. By those means they become *certain* proprietors of the precious metals under the form of money, and may on that account be called the *principal accidental species* of independent consumers.

2. All the individuals of an agricultural people, who, by their talents, their exertions, the services which they render to others, or even by their misery, know how to get possession of the precious metals, without being either cultivators of the soil, or manufacturers, or magistrates, or proprietors and stockholders. These can only be considered as casual owners of the precious metals, and for this reason we will distinguish them by the name of *the accidental accessary species* of the absolute consumers.

¶ 102. Thus, we may comprise all the various classes of society in the following synoptical view:

A. Dependant consumers.

I. Cultivators of the soil in the most extended sense of this term.

II. Manufacturers and artisans.

B. Independent absolute consumers.

I. Essential absolute consumers—magistrates and public officers.

II. Accidental absolute consumers. 1. Accidental principal consumers—landed proprietors. 2. Accidental accessary consumers—lawyers, physicians, teachers, play-actors, beggars, &c. &c.

¶ 103. The class of the cultivators of the soil, and of the manufacturers, procure their annual revenue, that is to say, the quantity of precious metals which they are allowed to devote annually to their own consumption, by selling the productions of the earth which they have reared, or else the result of their manufacturing industry, to the absolute consumers, and among themselves, one to another.

¶ 104. The essential species of absolute consumers derive their annual revenue, which is called the public revenue, from the portions which all the individuals of a nation are contributing towards the formation of that revenue.

¶ 105. The accidental principal subspecies of absolute consumers derive their annual revenue entirely from the rents which are paid to them from a portion of their annual revenue by the cultivators of the soil, to whom they have conceded the enjoyment of their property.

¶ 106. The accidental accessary subspecies of consumers, finally, derive their annual revenue from the profits, salaries or charities which all the individuals of an agricultural nation are willing to grant them from a portion of their revenue.

¶ 107. Thus, all the individuals of each of these various classes and species of men, are maintained by those who furnish them their annual revenue; but it is evident, that ultimately, they are all equally maintained by the cultivators of the soil and the manufacturers. The proofs of this proposition will be laid down in the following paragraphs. [¶ 108 —¶ 112.]

¶ 108. The cultivators of the soil and the manufacturers, furnish first together directly to the essential absolute consumers, a large portion of their annual revenue, and the remainder is furnished to them by the accidental principal and by the accidental accessary subspecies of absolute consumers.

¶ 109. The cultivators of the soil furnish directly *the whole* of the revenue of the accidental principal subspecies of absolute consumers, and consequently, the whole of that part which these contribute towards the formation of the revenue of the essential absolute consumers.

¶ 110. The cultivators of the soil and the manufacturers, furnish together directly to the accidental accessary subspecies of absolute consumers a portion of their annual revenue, and the remainder is furnished to them by the essential absolute consumers, and by the accidental principal consumers.

¶ 111. But as it is only from a portion of the revenues which the cultivators of the soil and the manufacturers furnish to the essential and to the accidental principal species of consumers, that the two latter can contribute to the formation of the revenue of the accidental accessary species of consumers, it is evident, that ultimately the cultivators of the soil and the manufacturers furnish together, either directly or indirectly, the whole of the annual revenue of the accidental accessary species of consumers, and consequently, that portion which these furnish to the annual revenue of the essential class of consumers.

¶ 112. Such then is the mutual dependance of the various classes of society, that ultimately, all the individuals of an agricultural nation, are maintained and supported by the cultivators

of the soil and the manufacturers, these two essential pillars of national prosperity.

¶ 113. These relations of mutual dependance between the different classes of political society will furnish us at the same time with a satisfactory explanation, why, in every agricultural nation there must exist two distinct owners of the precious metals under the form of money, viz. *permanent owners* and *momentaneous owners*, as will be demonstrated in the following paragraphs. [¶ 114.—¶ 119.]

¶ 114. The cultivators of the soil and manufacturers, are laboring only, because they do not possess beforehand the money destined to form their revenue, whilst, on the other hand, the absolute consumers are exempted from labor, because they have beforehand the certainty to enjoy the revenue destined for their consumption.

¶ 115. Thus, it is manifest, that the cultivators of the soil and the manufacturers, would have ceased to work from the moment that they would have possessed beforehand the money destined to form their annual revenue, and that on the other hand, the absolute consumers would have been obliged to devote themselves to labor as soon as they would have lost the previous certainty to enjoy their annual revenue.

¶ 116. The one and the other case would have taken place, if the cultivators of the soil and the manufacturers had appropriated to themselves in an absolute manner, the precious metals under the form of money, in exchange for the natural and artificial productions which they would have furnished to the absolute consumers. In such an order of things, the absolute consumers would have passed alternately into the ranks of the productive and laboring classes, and these into the ranks of the absolute consumers.

¶ 117. A similar instability in the condition of the principal classes of society would, however, have necessarily exerted the most unfavorable influence upon the happiness and prosperity of civil society. Not only it would have opposed the greatest obstacles to the progress of industry, which flourishes and prospers only, when men devote their labor unceasingly to the same kind of occupations, but these continual vicissitudes

would have troubled likewise the tranquillity of the whole society, by exciting the most violent and the most uncontrollable passions.

¶ 118. Hence, it appears, that under a good system of political economy, the agriculturers and manufacturers were to be preserved in their original condition. And as this would have been impossible, if they had not returned to the absolute consumers the precious metals under the form of money, which they would have received from them in exchange for their natural and artificial productions, it is evident, that the cultivators of the soil and the manufacturers were to be only momentaneous owners of the precious metals under the form of money, whilst the absolute consumers were to be permanent owners of these metals.

¶ 119. Nevertheless, though the cultivators of the soil and the manufacturers were continually to return into the hands of the absolute consumers, the money which they had received from them in exchange for their articles of want, of commodiousness and of luxury, which they had provided them with, it is not less certain, that the first were to enjoy the use of this money for their proper consumption before returning it into the hands of the absolute consumers, because, the hope alone of this enjoyment could engage them to devote themselves to the hardships of labor.

¶ 120. The errors into which governments, and sometimes even philosophers, have fallen, concerning the degree of welfare which the nature of things seems to have allotted to the laboring classes of society, will require, that we should establish with some precision, the principles upon which the prosperity of these classes ought to be founded. This task we will endeavor to perform in the following paragraphs. [¶ 121.--¶ 124]

¶ 121. The physical welfare of man consists in the quantity of articles of want, of convenience and of luxury, which he is capable of devoting to his consumption. Consequently, the physical welfare of every individual is necessarily in a direct proportion with his annual revenue in money.

¶ 122. But as the annual revenue of the absolute consumers is to become necessarily the annual revenue of the cultivators

of the soil and manufacturers, in exchange for their natural and artificial productions, it is evident, that the same quantity of money, which is employed in the consumption of the absolute consumers, must likewise be employed in the annual consumption of the cultivators of the soil and manufacturers, and that the physical welfare of these classes must be in a direct proportion with the quantity of money which the absolute consumers devote to their annual consumption.

¶ 123. According to this principle, the physical welfare of the cultivators of the soil and the manufacturers, would have been invariably equal to that of the absolute consumers, if the population of the former had kept invariably an equal pace with that of the latter, but as in the natural order of things, the population of the laboring classes was to be continually superior in numbers to that of the absolute consumers, it is clear, that the mean proportion of the individual consumption of the absolute consumers was to be invariably superior to the mean proportion of the individual consumption of the cultivators of the soil and manufacturers.

¶ 124. From this reasoning it appears, that the physical welfare of the absolute consumers ought to be, indeed, superior to that of the essentially laboring classes, because, the population of the latter must be of course, superior to that of the former; but it is likewise incontestible, that the welfare of the laboring classes ought to be invariably proportioned to that of the absolute consumers, as it is to be always in a direct ratio with the quantity of money which the latter are devoting to their annual consumption.

¶ 125. The inhuman measures which some despotic governments have taken, in order to check the laboring classes in the progress of their physical welfare, have never failed to produce those lamentable effects, which are naturally to result from them. For, experience has proved, that the essentially laboring classes accustom themselves to consider the physical welfare which they enjoy, as the real equivalent which they are entitled to claim in exchange for their labor, and that from the moment, when any considerable inequality begins to be introduced into their mutual exchanges, they begin likewise to diminish their labor in the same proportion, in which their physi-

cal welfare is diminished. And this diminution of labor will not only put a stop to the further progress of a nation in its prosperity, but contribute likewise in the most essential manner, towards the decay and fall of the commonwealth.*

(To be continued.)

REVIEW.

AN APOLOGY FOR THE LIFE OF JAMES FENNEL, WRITTEN BY HIMSELF—PHILADELPHIA, 1814, 510 pp. 8vo.

AN apology for a whole life of errors!—Let human frailty be comforted by meek indulgence; let the reed, broken in the storm of passions, be redressed and supported by christian charity; but let not vice and folly claim a *right* to our forgiveness, merely by telling us with the candor of levity, how much they had been vice and folly!

When the unfortunate J. J. Rousseau wrote the history of his life under the modest title of *Confessions*, the austere part of the public raised a general outcry against the publication.—The vanity of the philosopher proved offensive to some, but many more were highly shocked at the relation of scenes, in which the laws of morality appeared to be essentially outraged. Nor were these reproaches without foundation; but the whole presented such a novel exhibition of a character interesting

* The author of the Aphorisms is sensible, that some propositions contained in this chapter, will not be easily reconciled with the feelings of many inhabitants of the United States, and that others *seem* to be in a direct contradiction with existing facts. He will content himself with remarking for the present, that he meant only to lay down the most general principles, independent of any modification which peculiar circumstances may require. The situation of a new and rapidly growing country is so very peculiar, that it presents a new series of phenomena, which find no parallel in long established societies. These phenomena, the author of the Aphorisms means to discuss in a particular and separate article, as the aphoristical form does not easily admit of the developments which it will require.

even in his errors and weaknesses, the offences given to morality were so much retrieved by the most noble and virtuous sentiments uttered in that glowing language, which can have its source only in the heart, and many of his most glaring failings were evidently so much constitutional, that the feeling part of his readers were readily inclined to bestow that indulgence which *fallen genius* may justly deserve. But here we have before us a man of a quite different cast; howsoever high we may place him in the ranks of his profession, he does not, in our opinion, possess the same claims to the attention and esteem of the public as the philosopher of Geneva. He makes no confessions, but *an apology;* he relates his errors with a kind of self-complacency, which is but ill redeemed by common place declamations on prudence, conduct, wisdom, &c. and after all, he means to shew, that the fault is not his, but that of *his too indulgent parents.*

It may be questioned, however, whether the book of Mr. Fennel ought to be more the subject of an honest indignation or that of smiling pity. Whether it be the one or the other our readers may decide from a short and compressed sketch which we shall present them of these memoirs, and in which we shall frequently use the proper words of the author.

Mr. Fennel was "somehow or other tossed by nature, as a new football for the sport of mortals upon the rounding surface of this globe, one morning, called the eleventh of December, in the year one thousand seven hundred and sixty-six, of the Christian era." His father was chief of the treasury department of the Navy Pay, and as such, enjoyed a considerable [he says, "respectable"] income. After he has duly acquainted us with all his relationship, he relates in the following manner the first event of his life which made upon his tender mind an everlasting impression.

"I had a tumor of some nature on the upper part of my right arm. The surgeon who had attended me, had promised to return in the afternoon, to make the necessary incision. I was lying in the parlor, on a pillow, between my parents. They had already placed a cushioned armed chair close by the window, with the necessary bandages. My parents had been conversing on the subject for some time, without any

particular attention on my part, till the following words arrested my ears.—"James is a brave child, and will bear it firmly." Parents! reflect on this apparently trivial occurrence. On the impressions then made I can found all my erroneous decisions through life—*from* them, as the descending spider from his web, I spun the attenuated thread that let me down—and *to* them I can trace the irrational instinct which induced a man to weave such feeble plans for present safety, as only proved the prey of future blasts."

We must beg most humbly the pardon of Mr. Fennel for not being altogether of his opinion. Spiders and cobwebs and blasts apart, we think that we may collect from his own "apology," that upon the whole he was in more than *one* respect a naughty boy. He, occasionally, will tell a lie; when he is angry at school, he "tripps the scholars as they pass before the master, shuffles and scrapes; coughs, sneezes and groans, till he is ordered to confinement," he assists in the depredation of a neighbor's garden, and suffers himself rather to be severely whipped than to betray his accomplices, a punishment which does not prevent him soon after from picking cherries clandestinely in the garden of his aunt, &c. &c. For all these little tricks, however, Mr. Fennel gives us the best psychological and moral reasons, which go to prove that he was ill conducted by his parents and the people who surrounded him.

At thirteen years of age he was sent to Eton. In this situation, he says, "nothing of importance occurred, during the first three or four years, unless it should be of importance to know, that, being a stout boy, I was generally *forced* by the senior class, to steal wood and bring it to college; to knock down the neighbors' fowls, and watching the baker's tray, [while he left it outside of the door, to deliver a pye to a customer] to relieve him of his burden, by taking away as many as we could carry. These actions," Mr. Fennel adds jocosely, "were undoubtedly charitable, as the baker was thereby eased of his load, the woodman's horse less cruelly oppressed, and the farmer's wife divested of her care for those poor animals, who formed the principal ingredients of our college chicken feasts."

Another time he was *forced*—how unfortunate it is, to be always *forced* in this manner!—to assist in stealing six handsome chairs. He shared, likewise, in some less obnoxious

sports of the students. They contrived to establish a small theatre, upon which they performed comedies of their own composition. But as, in close imitation of Aristophanes, they traduced upon the stage personal characters, this pastime gave some umbrage, and the whole machinery was suddenly seized by the master, "who on this occasion destroyed more kings and queens with one word, in one hour, than could Bonaparte, with all his armies in one year."

At fifteen years of age he falls desperately in love with a young lady whom he had seen for a few moments, at the house of one of his aunts, and he makes a short escape from the college in order to see her; but, upon the whole, the more tender passions seem to have made upon his mind but a transitory impression at this, and any subsequent period of his life.—In the midst of all these diversions, he found yet, time to attend to his studies, in which he made such a rapid progress that he was capable of supplying a large portion of his comrades with their exercises in prose and verse, when they happened to be otherwise engaged. This, however, created much jealousy against him, in consequence of which, he was very much abused by one of the senior collegians, called prepositors. He then asked and obtained from his father the permission to return home, but shortly after, he was engaged to return to Eton, by the direct and indirect entreaties of the head master of that college. Some more skirmishes between him, his comrades and the master, rendered him, however, so uneasy, that "he worried himself into sickness—till on his return home, at the following vacation, he readily found an advocate in his tender mother, who persuaded his yielding father, to withdraw him entirely from Eton college."

Some time after, we see him in the company of Dr. Mosely and Mr. Walker "the celebrated philosopher," making a trip to Paris, His observations on this journey are wonderfully deep, and he has no sooner arrived on the French soil, than he is strongly determined to caricature every thing that he might see there. The first specimen which he gives us of his satirical humor, is the following description of the diligence, the horses and the driver.

"The physician and the philosopher placed themselves on the front seats, and we, Mr. Walker's son and myself, were ordered to take the hinder one, where we could see nothing, there being but a window of about four inches square, on each side, and so low that it would only permit us to look down towards the ground. Our equipage consisted of a large Flanders mare, in the shafts, a diminutive animal on the off side, which I suppose must have been some kind of a horse, as the postillion addressed him as such, with a severe application of the whip, and the appellation, without its delicacy, of Sterne's distressed ladies, and another on the near side of the great mare, ornamented and honored by bearing on its back one of the neatest jockeys we had ever witnessed. His head was adorned with a three-cornered hat, which had formerly been edged with lace, as we could plainly discover from the remaining pieces that were still dangling about it; it appeared, as if in the hurry of departure, he had seized the cook's dishcloth, to serve him as a cravat. Diminutive as he was, it seemed as if his jacket had been obtained from a drummer-boy, for it had the appearance of having been once regimental, but one sleeve of it having decayed, as all things must, and left the lower part of the whip arm bare, and the other having been so torn into dangling remnants, there being also a considerable chasm on each shoulder, neither physic nor philosophy could determine what it had been: but amidst this confusion of ornament, one thing shone with superior lustre. It was a plastered head, clotted with flower, from which dangled, as if designed as a substitute for the poor beasts tail, an immense Rammilies at least three feet long, which was doubtless intended for the purpose it effected, that of brushing the flies from the horses back. His red plush breeches, and his jack boots, completed his equipment.

We learn in the continuation of this narrative that Dr. Mosely owed the principal part of his celebrated treatise on coffee, to an article, which Mr. Fennel translated for him from a huge folio volume which the doctor had borrowed from the king's library, a detection which presents his patron in the light of a literary plagiarist.—The introduction of the travellers at the court of Versailles, on the fete de St. Louis, is minutely and most ludicrously described. Mr. Fennel is permitted to kiss the hand of the Dauphin, and after having visited every thing admirable in the royal abode, he returns with his companions to Paris.

If Mr. Fennel had not every possible claim to credibility we might be strongly inclined to disbelieve the following anecdote.

"We, of course, visited the theatres frequently. One evening I was very much shocked, at seeing the characters of our Saviour, the Virgin Mary, Mary Magdalen, and the apostles, exhibited on the stage. The person who represented our Saviour had his head extravagantly dressed, frizzled, and daubed with powder and pomatum. He had a large bag dangling from the back of his head; a full dress; superb suit; silk stockings; shoes with diamond or paste buckles; a chàpeau de bras, and a handsome sword by his side."

"St. Peter, who was standing near him, but had been engaged in something with the other apostles, that had required him to lay his hat and sword on the table, had perhaps been too tedious in his business, when the man, *mis*-representing our Saviour, cried out to him

"Allons!
"Prens ton chapean et ton épée,
"Et snive moi dans Galilée."

The travellers are invited to witness a most splendid fete champetre, which the prince de Condé had prepared for the count d' Artois at Chantilly, but which could not take place on account of a violent storm.—A visit to the Academy of Sciences, gives our author occasion to relate an anecdote not less probable than the former, but of which, unfortunately, we do not find the least record in the memoirs of that learned body.

"We were invited, while in Paris, to attend a meeting of the celebrated academy of arts and sciences. We attended, entered the room, and were with all politeness, ushered to our seats. There was a balloon floating about the room. The solemnity began, the president called to order, and all was silent expectation. I had raised my mind to embrace the highest pitch of science, when the president, looking over his record, called the first name on the list. The person advanced. My eyes were open to gaze on some new wonder, when the gentleman, after a short preface, produced from his pocket a *wig!* Risibility, I believe, is independent of the mind—I involuntarily smiled, before I reflected that there were older heads than mine that wished for warmer covering than those which nature had left them."

"The gentleman expatiated a long time on the virtues of the improvement he had made, in what I think we nominate "the caul."

After six weeks tour and such an abundant harvest of precious information, as we have seen from some specimens, Mr. F. returns with his company to England. He is sent now by his father to the university of Cambridge, and setts off in a gig, "proud of having the appearance of something like a man."—At Cambridge, he is "for some little while sedate and regular,"

and studies very hard; but soon after he gets in the way of frolicking, which, nevertheless, does not prevent him from penetrating into all the depths of science and literature. Mathematics and electricity, anatomy and chemistry, natural history and the ancient classics, become all equally familiar to him, and he is the wonder and ornament of the whole university. This close application to study is a little interrupted by the horse-races at New-market, which offer to our hero a temptation that he cannot withstand. He repairs there in style, bets and wins, bets and wins again, and consoles himself for the slight punishment which is inflicted on him by his tutors at Cambridge, with a pocketful of money. He now purchases horses, a gig, and every thing that can make him appear at the next races in high and finished style. But alas! Fortune, that fickle goddess, who delights sometimes in humbling the proud and in raising the humble, had doomed him to experience the most doleful effects of her caprices. He now laments his folly, but "wants courage to oppose temptation." He "continues visiting New-market during the whole of the spring meeting, betting with various success, and returning occasionally to Cambridge to attend chapel in the morning, to save appearances," and, no doubt, to give his comrades the example of the most laudable sincerity and uprightness.

This period of Mr. F's life, is marked by all the traits that characterize—he will pardon us the harshness of the expression—the most complete coxcomb. He is absolutely resolved to be a fashionable man. There is no party, no assembly, no ball, where he does not appear with all the equipage of a first-rate *beau*. He frequents still his dear New-market, and not content with betting and losing at it in the morning, he "rushes to the faro and LOO-tables in the evening. His good luck, however, has now left him entirely, and after having lost every cent in his pocket, he finds himself near two hundred pounds in debt. A penitential letter written to his "too good father" is answered by some mild censures, and a draft of two hundred and seventy-five pounds. Feeling himself relieved from his anxieties, and no doubt, from his compunction, he enters upon new schemes of pleasure and enjoyment. A trip through Wales

is projected during the next vacation, along with a friend, at the house of whose father in Cheshire they intend to stop on their return. The plan of the journey is laid out in the most economical manner, but they have scarcely reached Congleton when they feel their purses so extremely light, that Mr. F. is obliged to remain at the tavern of that place in pledge, as it were, for the payment of the bill, while his friend proceeds for a supply of money to the house of his father, which was only eleven miles distant. When relieved from this new trouble, Mr. F. pays a visit to Buxton, a celebrated watering place in the vicinity. The company assembled at that place was extremely dull before his arrival, but he contrived to put every one in humor, and to be the president and director of the festivals of every day. He gets now into the company of the great and thinks himself on that account many inches taller than he was before. His acquaintance, particularly with lord Bective, operates such a strong impression upon his mind, that even after the lapse of twenty-five years, his feelings on that occasion burst forth in the most uncommon and pathetic language. "Every *valve leading to his heart* was open to receive this friendship; he sheds even now tears of gratitude for it, because, *the fountain of the eye is inexhaustible*, and the *dews of recollection* will lend their *moisture to the stream that pays too liberally its tribute to a burning sun.*" To heighten still more the stage-effect of these sentimental strains—whose plain and natural expression our readers will not fail to admire—he falls violently in love with lady Harriet, the daughter of lord Bective, which, however, does not prevent him from falling more violently in love with gambling. Forgetting that he had already frequented before the faro-table at New-market, he makes a pathetic appeal to the earl of Rinnaird, to do him justice and to confess that *he* had betrayed him into this folly. At any rate, it seems to be necessary to the dramatic effect of our author's "apology" to be seduced into vice by great and illustrious characters. He loses during one sitting, with one man, thirteen hundred pounds, and is now exposed to feel all the pangs inflicted by remorse and a distressing situation. The friend with whom he had travelled, hurries him off from the scene of his errors, to the house of his

father, where he meets with the most friendly reception. During his stay in the midst of this friendly family, he pays a visit at the seat of lord Stamford. Here every thing meets with the admiration of our author. The mansion, the lord, the ladies, the furniture, the table, and even the gold and silver plate, receive their round of complimentary commendation; but of all the things most admirable in this admirable place, none of course, obtains more freely Mr. F's homage, than the ladies. They are all beauty, virtue, kindness, amability, &c. &c. though one of them observed to him rather tauntingly, "I never heard a gentleman talk such nonsense in my life; sure you don't know what you have been speaking about!"

A variety, as it may be expected, of the most interesting and novel anecdotes are related, on occasion of this visit at the seat of lord Stamford; one single specimen, however, will be sufficient to give a full idea of them all.

"With respect to Mr. Carr, I regret that I have to relate one circumstance which occurred in our visit to lord Stamford, which seemed to me irreconciliable to his general conduct.—Mr. Carr was particularly fond of certain delicate, but rather uncommon dishes; the countess of Stamford knowing this, had ordered three of different kinds to be prepared for him, and had even superintended the cooking of them herself; *this* circumstance, however, was not known to Mr. Carr, until the covers of that course had been removed; when lady Stamford observed, jokingly: "Mr. Carr, I have been unfortunate in my expectation of hearing you praise my cooking; of three dishes I had myself prepared purposely for you, you have not tasted one." That Mr. Carr had not a knowledge of this fact, I believe; but it being well known how fond he was of them, and they being dishes of an uncommon nature, he should, I think, have guessed it, in the refinement of politeness."

Mr. F's father, in the meanwhile, having been informed of the conduct of his son, recalls him now home with great anger. He has the mortification of being deprived of his servant, his horses and his gig, is occasionally scolded by his father, taunted by his sisters, and disregarded by the whole family. One should have supposed this to be the natural consequence of his extreme levity, but Mr. F. proves, that his relatives were in the wrong, and that by acting in this manner, they paved the way to his future misconduct.—Seeing that his father

had determined to refuse him any more money, he runs away to London. After all that we had heard before, we are rather surprised to learn, that until *then*, his destination had been for the *church*, and that he himself had cherished an uncommon predilection for this *calling*. He confesses, however, that the idea of submitting to humble situations in life, before he would be appointed a bishop, disgusted him at once with the ecclesiastical gown, and he turns on a sudden to the study of the law, to which he attaches himself with great ardor. A reconciliation takes place between him and his father, but no sooner does he find himself relieved from his pecuniary embarrassments, than he insures lottery-tickets, frequents the faro-table, and proves by his prodigality in every respect, that

"Naturam expellas furca, tamen usque redibit."

A well meaning cousin undertakes to give him practical lessons of economy, and is paid for his kind intentions with the sneer of ridicule.....He rushes from folly to folly, and bids, finally, an eternal adieu to the dry pages of Blackstone and lord Coke, to appear on the stage of Edinburgh as—an *actor*.....The frequent humiliations which he receives in that city from some of his former acquaintances, cannot shake his resolutions. He performs on several theatres with success, and promises to form an epoch in the history of the English stage. At the same time he is forming connexions with literary characters, among whom, if we believe him, he shines with great lustre. The experience of the past, in the meanwhile, is totally lost for his reform. He squanders immense sums in extravagant expenses for his manner of living, but especially for stage-dresses. Some other little whims are indulged from the most reasonable motives. Thus, Mr. F. takes snuff out of a golden snuff-box, because, in a company where he is present, lord Torptichen's snuff-box is very much admired. His vanity, however, was soon to receive a very severe check, and he was to experience that the crowns of play-actors are frequently crowns of thorns. The rivalship of a brother-comedian rouses against him a violent storm, in which our hero is rather worsted; and the man who was too proud to stoop before a good and affectionate father, is, finally,

obliged to make humiliating acknowledgments before the loungers in the pit of a theatre. He consoles himself for this disgrace by leading the dance with Marchionesses, Countesses, &c. and spends the greater part of the ensuing autumn and winter with Mr. Bruce, the celebrated traveller to Abyssinia, at his seat at Kinnaird, in Scotland. After the most bombastical encomiums bestowed on this person, we receive, nevertheless, a hint, that he was "deficient in some theological and cardinal virtues, and that to reduce him to the standard of human beings, some defects seemed necessary." In order that his readers might have a fully adequate idea of the superiority of his host, Mr. F. relates the following striking anecdote, for whose preservation, succeeding generations will certainly be thankful:

"Having been one morning so interestingly engaged, as to have neglected the passing hour—I was summoned to dinner, while yet in my morning gown and slippers. I hastened to the dining room, and had apologized for my not being prepared in dress, when Mr. Bruce observed, "the greatest favor you can render me, is to make yourself perfectly at ease and happy in my house."

Incidents of the same extraordinary nature fill many pages in Mr. F's ponderous volume.—But before we leave with him the house of Mr. Bruce, we must not omit to mention an instance of his rare modesty. Mr. F. has it from *hearsay*, that in an Edinburgh Review, *he does not know which*, it is stated, that Mr. Bruce is indebted to him for some of the most valuable parts of his work. Mr. F. is too eager to "render unto Cæsar that which is Cæsar's," not to decline this unmerited praise. He first denies having had any part in Mr. Bruce's work; yet, after a little while it comes out, that he has corrected it, and put it into English; for Mr. Bruce knew, indeed, almost every language under heaven, but he had forgotten his English, and written his book in the Scotch idiom. This translation from the Scotch into English, however, is not the only literary feat, in which we see Mr. F. engaged, at this period of his life. He forms the plan of writing a Dictionary in eight different languages, and he is so much enraptured with this idea, that in order to execute it, he determines to retire to *a cave* [!!] and actually purchases an *hermit's dress* [!!] to appear in a garment suitable to the place. Of his capacity for such a task, he does not

entertain the least doubt, but the scheme is soon relinquished, only "because he finds it too troublesome." Having made the best that he could of his hermit's suit, he reappears on the stage, and performs on the theatres of several country towns. In the course of these perambulations he becomes acquainted with the tragedian Cooke. Mr. F. who, as we have seen, is a good hand at "apologies," not contented to apologize for himself, introduces a long apology for his deceased friend, and rebukes Mr. Dunlap, his biographer, most severely, for having treated his faults with too little ceremony. Finally, he proceeds to London, but the very day of his arrival in that city, he is thrown into a prison, from which he escapes only by obtaining bail. He performs with applause on the theatre at Richmond, and as every thing difficult is but a jest for him, he composes in the space of three days, and out of mere complaisance for an actress, a play in two acts, which was perfectly well received, and which since, he tells us, was "localized" in Philadelphia and played at Boston.

During the next winter we see him engaged in various pursuits. At one time he performs wonderful cures by electricity; at another he forms an extensive literary scheme, with which he is highly pleased for a while, but as it is his fate "always to begin at the wrong end," this enterprise is soon relinquished. Whenever the state of his purse is rather low, he flies as a true philosopher, from the bustle of London, and wanders through the country in every direction, avoiding the main roads, and rendering himself acquainted with every thing that can attract curiosity. To exercise in these excursions acts of charity, to relieve the distressed and to console the unfortunate, is one of his most delightful employments. We give Mr. Fennel fully credit for these benevolent dispositions, but we lament with himself that his liberality has never been supported by the sister virtue *prudence*, for *he* only can be truly generous who knows how to spare.—In this wandering manner he spends nearly three years, until he engages for a number of representations at Covent-garden theatre. Next he writes an agricultural treatise, resumes his Dictionary and gives it up nearly at the same time; he translates a comedy of Goldoni, but—never finishes it.

Now he writes in all haste a farce which is performed for several evenings in London, and afterwards on the theatres of America. Disgusted with being obliged to perform in a foolish piece, entitled The Picture of Paris, [1790–91] he withdraws from the theatre and establishes a weekly paper under the title of "the Theatrical Guardian," but all his perseverance in this task is exhausted, when the publication has reached only a few weeks. He continues, however, his literary lucubrations at a country seat of a friend where he spends about eight months. A translation of Marmontel's Incas, but which was never published, because the manuscript was afterwards lost, scenes and plots for plays, &c. and horticultural experiments, in which he succeeds so far as to rear "sugar peas as large as a common pistol-bullet," engage alternately his attention; yet of all his exploits in this rural retreat, the one which appears to flatter most his vanity, is his exchanging parts with a parson, and writing a sermon. Let us hear him on the subject:

"I had engaged with my friend one Saturday, to attend him on a shooting frolick, to which I never felt much attached, for I believe, all the partridges in England, France and America, could not support an action of murder against me for the destruction of a single one of their race, and find me guilty. I was, however, happily relieved on this occasion, by the arrival of the young clergyman of the parish, just as we were about to start. My friend invited him to join in the sport. He observed that he had no gun and accoutrements, and that besides, he had not written his sermon for the next day. I told him, that he was heartily welcome to my gun and equipments, and that, if he would take my place, I would stay at home and write his sermon for him, and it should be ready by the time of his return to dinner."

"This being agreed to, I asked him for a text. The New Testament was produced, and he opened it at the page which contains the shortest verse in it: "*Jesus wept.*" We separated to our respective employments. I wrote the sermon for the young parson on that text, while he was shooting partridges for my dinner; delivered it to him, and he preached it the next morning. After that time I lent it occasionally.—My wife's father preached it several times. The same I afterwards brought with me to America, and it was delivered at Annapolis by the Rev. Mr. Higgenbottom, and since by many clergymen in the United States."

On his return to London, money was still very scarce with him. He is driven to many and various shifts to supply the wants of the moment, and out of *ennui* fights a duel, in which, happily, nobody is killed. It is probably out of *ennui* likewise, that he takes a wife on a sudden, after having formed the most solemn resolution never to marry. Of the person who fixed his choice so instantaneously we hear but very little, and the story concerning their mutual acquaintance is extremely lame.—Shortly after their union the new couple set out for Paris, where Mr. F. means to deliver readings and recitations in English. But the French capital was at that period [1792,] a theatre of the most tumultuous and bloody scenes. Mr. F as we may expect, gets into many scrapes, and is happy, after the disastrous 10th of August, to make with his wife a safe escape to England. In the meanwhile, the British island was not less agitated, and the political fermentation excited by the storms of the French revolution, required the speediest and the most active remedies. Mr. F. who, occasionally is every thing, appears now under the character of a politician. He is appointed secretary to a club, and shews so much talent and zeal in this capacity, that he "succeeds so far as to give energy to the government and decision to its measures." The ministers, impressed with the sense of his merit, give him the most flattering promises of rewards and advancement, which, alas! are never accomplished. Filled with the utmost indignation at so much ingratitude, Mr. F. resolves to bid an eternal adieu to his native country and to accept of the proposition made to him by Mr. Wignell to engage for the projected new theatre at Philadelphia. But before he starts, he is gratified with the sight of a singular apparition:

"I had one evening, being much fatigued, retired to bed early: I had scarcely dozed, when I was alarmed with what appeared to be like the drawing of my curtains, at the foot of my bed. I raised myself, and saw, or thought I saw (no matter which,) the figure of my wife's father, who immediately bade me adieu and vanished. There was no lighted candle or lamp in the room; yet, in spite of every thing that can be said to the contrary, I declare solemnly, appealing to my God for the truth, that a something, having exactly the appearance of the Rev. Dr. Porter, in his usual dress, appeared, or seemed to appear, at the foot of my bed, as plainly as I ever witnessed man."

"After a restless and distracted, sleepless night, I arose at day-break, and tried by every mental and physical exertion, to remove the impression made—in vain. Having walked about an hour or two, endeavoring to invigorate my mind with the pure air, and correct what I then thought an erring imagination, by the contemplation of the beauties of nature, without effect, I determined to commit my feelings to a letter, and ascertain the correctness or impropriety of them. I did so, informing a cousin of my conviction that my wife's father was dead. This letter I put into the post-office before ten o'clock. About four o'clock in the afternoon, I received a letter informing me, that Dr. Porter had died suddenly the night before; he had met in the street a friend, who had informed him, that he had seen in one of the papers a paragraph mentioning that Mr. F. had engaged with Mr. Wignell to embark for America. Dr. Porter procured the paper, and proceeded immediately to my wife's sister to inquire respecting the truth of the report: she was from home, and he, on being so informed, with the show of considerable impatience, left the house. He went home: the next morning sent for a notary; altered his will; left my wife one shilling; and died in the evening suddenly, in a chair, while on a visit at a neighboring house, and at the moment when I thought I saw him, being seventy-six miles from London."

On the arrival of Mr. F. at New York, the yellow fever spread its ravages at Philadelphia, there was consequently no possibility of opening the theatre; but Mr. F. found an intermediate resource in giving to the French refugees then lately arrived from St. Domingo, instructions in the English language. Soon after, Mr. Wignell the director, arrived with a numerous company of actors, whose distress, under existing circumstances, was very great; New Jersey, however, offered them a momentary asylum. When the yellow fever had ceased its ravages, Mr. Fennel conducted the company to Annapolis, in which town they were received with that endearing hospitality, which has gained to its inhabitants such an honorable reputation on both sides of the Atlantic. On his return from Annapolis we see Mr. Fennel very comfortably settled at Philadelphia, where, besides his theatrical performances, he procures an additional revenue from a course of "lectures"—we should rather think of exhibitions—on natural philosophy. Few foreigners seem to have been more favorably received in that city, or more generously patronized than Mr. Fennel, even if we

should find it necessary, to deduct something from the "intimacy of friendship," devoted to him by governor Mifflin, and other illustrious characters. But, as he says himself, "prudence always was with regard to him, so shy a goddess, that she never permitted him to touch the hem of her garment." One of his favorite pretensions, (among so many others) seems to be chemistry. Acids and alkalies, are to be found on almost every page of his work. Accordingly, we are by no means astonished, to learn, that he relinquishes every other thing for the sake of *salt-making*.—He obtains a patent (as it frequently happens) for a discovery made, some hundred years before his existence, in Europe, and forthwith he endeavors to realize his salt-making schemes. The legislature of Maryland is stubborn, and ignorant enough to refuse the very moderate loan of 5000 pounds for the establishment of his works. A private company of merchants of Baltimore, however, take up the idea; he is about being appointed director, but a single word dropt to his disadvantage by one of the members of the company, induces him to reject the proffered offer, and another is appointed in his place. Nevertheless, the liberality of Mr. Robert Oliver, of Baltimore, enables him to form a little establishment of his own on the Eastern Shore, where he succeeds very well. After the death of the director of the Baltimore company, he removes to the Western Shore, where he "passes many months in sickness and vexation" until he gives up the enterprise and returns to Philadelphia for the recovery of his health. Public recitations furnish him for some while with a competent revenue. He might have followed peaceably and with success, these easy occupations, if his hobby-horse, *salt-making*, had not interfered with his more congenial pursuits. He establishes with much labor and expense, salt-works on the shores of New Jersey, by means of which, he finally sinks fourteen thousand dollars. The stages of Philadelphia and of Baltimore together with public recitations during the vacations of the theatre, again replenish his empty purse, but do not prevent him from being soon confined for debt. Such, however, is the generosity of Mr. F's friends and acquaintances, that not only, he makes a safe escape from the talons of justice, but that he is

enabled immediately after to purchase the circus for eight thousand five hundred dollars. The plan formed on this occasion by Mr. F. like all those which he had formerly projected, terminatec in a complete failure, the circus is mortgaged for 1600 dollars, which, through excellent management and the honesty of some individuals, are reduced to nine hundred. After these skilful financial operations, we cannot be astonished to be informed, that Mr. F. spent the ensuing winter in great distress, and that he was obliged to make basket salt for his daily bread. No sooner, however, is he relieved from these unpleasant embarrassments, by the benevolent society of the masons, than he again erects salt-works in the vicinity of New York, which are destroyed by fire. He returns now to the stage, and performs alternately on the theatres of Philadelphia and New York. But the salt mania has not yet left him; new salt-works are established by him near New-London, which employ nearly three years of his life, swallow all his earnings from the theatre, and are, finally, swallowed up themselves by the sea in less than one hour. From this moment the scene of his activity is shifted for a while to Boston. He performs on the theatre of that city, and recites with great applause and emolument. A school of reading and elocution which he establishes, succeeds likewise very well. In the midst of the comfortable situation in which he is now placed, his restless mind plans new schemes, and the happiness of the present is again sacrificed to visionary prospects. It has been suggested to him, that the establishment of a college at Boston, after the model of the school at Eton, would meet with a liberal encouragement. Though some sober friends endeavor to persuade him, that the difficulties arising to the merchants of that city, from the embargo, will check their liberal dispositions in support of his scheme, he still embarks headlong into this enterprise, rents a large and magnificent house, furnishes it in high style, provides for every thing that usefulness, taste and luxury, may demand, and nothing more is wanting, but—scholars. These, however, flock in but sparingly, and Mr. F. after having struggled for some time against every kind of perplexity, relinquishes his splendid establishment with a loss of twelve thousand dollars. An agreeable country-seat, which the ge-

nerosity of a friend has put to his disposition, shelters him from the threatening pursuits of his creditors, and affords him leisure for resuming his literary occupations. He leaves occasionally his retreat, to appear on the stage, and instructs pupils during the ensuing winter. After this time, we see him adhere more permanently to the only profession in which his successes are truly indisputable. He takes alternately, engagements with the theatres of New York, Philadelphia and Baltimore, and, if we except some little bickerings between him and his fellow-actors, this career is not embittered for him, either by persecution or by disappointment. During the vacations of the theatre, he recurs frequently to recitations and instructions in reading and elocution. In this latter occupation he is particularly favored in Philadelphia by the protection of the respectable society of the Friends, whom he alienates soon after, by introducing into his school, scenic representations. A trip to Washington and Georgetown, where he plays and recites, gives him occasion to relate a difference in which he is engaged with the mayor of the latter place, and in the course of which he displays his wit in a manner extremely gratifying to himself, though we doubt very much whether our readers would thank us for filling our pages by transcribing it. As he is now in a mood of quarrelling, he quarrels with his landlord on his return to Baltimore, falls out with some of his comrades, and has finally the misfortune of being lodged in jail for debt during sixteen months. The present publication seems to have been undertaken, soon after this period, in Philadelphia, where the author now resides, performing on the theatre with less success than formerly, because he is suffering under disease, and partly disabled by a fall, and giving lessons of reading and recitations, in the academy of Dr. Grey, and Mr. Wylie.

Such has been the eventful career of a man whose life has been uncommonly agitated. Mr. F. is candid enough, not to ascribe the greater part of his adverse fate to the blind government of fortune, but to himself. He frequently and bitterly laments his want of *prudence*. If he will forgive us, to give freely our opinion on a subject, which he himself has laid open to the scrutiny of the public, we should be inclined to think that want of prudence was not his only fault. No man, certain-

ly, had more frequent, nor better opportunities of doing well. No foreigner in this country had ever been so much favored, so much supported, so much patronised. A very small part of the sums which Mr. F. squandered in the most thoughtless manner, would have sufficed to establish on the most solid foundation the fortune of any intelligent and industrious character. The *fickleness of his temper*, his running from scheme to scheme, without ever terminating any thing, is not less conspicuous in his memoirs than his want of prudence. We might, moreover, suspect, that Mr. F. frequently overrated his powers. He speaks of the most difficult enterprises with the confidence of a man, who is conscious that he can do any thing; and yet—we beg once more the pardon of Mr. F.—the specimen of his literary acquirements, which we have before us, does by no means justify these sanguine presumptions. It is scarcely possible to read any thing more disgusting in point of affectation, false taste, and want of correct reasoning, than his apology; and with regard to his pretensions to scientific knowledge, the present work, at least, shows them in the most dubious light.

We have no particular prejudice against the theatre, from which we have frequently derived the highest gratification; much less, have we any reason for animosity against Mr. Fennel, whose person is altogether unknown to us. But we must acknowledge, that so far, we have espoused the general prejudice against play-actors, as to believe, that there is something in their profession, which does not present their character, howsoever amiable and estimable it may be otherwise, in a very commendable manner. The highest degree of perfection in the actor, is *to feign* feelings and sentiments which he does not possess, to assume a character that he has not, and consequently to deceive. Can we candidly suppose, that the habits of the professional man will have no influence upon his conduct in private life? Can we trust the smile of friendship, the tear of sensibility, or the angry frown of him, whose every feature is *taught* to compose itself at the command of *cold* reason? The reply becomes unnecessary; and what is every other perfection of the mind and of the body, when *truth* and *candor*, those corner stones of the edifice of morality, are not united with them in beautiful harmony!

MISCELLANIES.

TO READERS AND CORRESPONDENTS.

THE delay which the publication of the latter numbers of the Western Gleaner has experienced, requires all the indulgence of our readers. This indulgence, nevertheless, the Editor flatters himself to obtain, by mentioning, that the state of his health, connected with circumstances which it was not in his power, either to foresee or to prevent, has thwarted his most sincere wishes to fulfil his engagements. He confidently hopes that he will be enabled to hasten the publication of the succeeding numbers and to restore the work soon to its primitive regularity.

The Editor seizes upon this opportunity to explain himself concerning the plan which he has hitherto pursued, and which he means hereafter to pursue in this publication. It has been remarked by some that it was deficient both in *variety* and *novelty*, the two first requisites of every periodical work. This charge the Editor cannot absolutely deny. Impressed with the wish of being essentially useful, he has frequently selected subjects which will scarcely afford any pleasurable sensation to the mere lounger, while he is convinced that a more general diffusion of the knowledge respecting them, cannot fail to contribute towards the improvement of our Western Country. To treat these matters by mere scraps and fragments would have altogether frustrated his design. He, therefore, preferred collecting under a concentrated and connected form, the most important materials relating to the same subject, and forming out of them as much as possible one whole. That in this manner *novelty* could not be exclusively contemplated, that old and known matter should be intermixed with new information, might be naturally expected. The country which we inhabit, moreover, is not a country of discovery, for which the means and situation of our citizens are but little adequate; but even to draw from the rich store of useful improvement which is accumulated in the old world, will not appear a task altogether without merit, and as soon as our poli-

tical circumstances will render the best and most recent sources more accessible, the Editor pledges himself to furnish his readers with more satisfactory communications.

Another complaint has been made against the frequent use of the technical language as being contrary to popularity.—That the Editor has taken in this respect a stand too high for many of his readers, he is fully sensible, but he thought himself sufficiently justified in doing so, by the example of some of the most popular publications, in which we perceive uniformly the use of the scientific language, as the only one which unites precision with brevity. It will be sufficient, nevertheless, for him to know that he has not been intelligible enough, to endeavor by all his means to meet the wishes of his readers.

It is with regret that the Editor finds himself deficient in the fulfilment of the promises which he has proffered to his readers, with regard to the communication of statistical knowledge. He is persuaded that no kind of information is better suited to a periodical work than this peculiar branch. Whilst history shews the passing events in their more or less rapid succession, statistical science exhibits a faithful portraiture of the situation of a country at a given moment. Those who are the best acquainted with the subject of the likeness, may still be pleased with the accuracy of the drawing, and the more distant readers will collect an information, which, in an economical, commercial and political respect, recommends itself highly to the attention of every American. If a regard for national glory is an allowable object, as we fully believe it is, the inhabitants of our western country are highly interested in recording with minuteness, the annals of their prosperity. Habit has rendered us almost indifferent to the wonders which we see every day around us. But where is the age, the country or the nation which has ever witnessed the rapid strides with which *we* proceed towards all the enjoyments of the most anciently civilized nations. Let us then preserve on our pages the faithful memory of *what we are*, that we may look back from time to time with conscious pride to *what we have been*, and tell the wondering world of what noble and successful exertions Americans are capable. To do the best that we can towards the execution

of this plan, it is our intention to begin in the next number with *the picture of Pittsburgh.* At the same time we are sorry to state, that hitherto all our attempts to obtain from other parts of the western country, accurate statistical accounts, have failed of success; but this failure itself must be considered, not as the effect of incapacity—for we possess among us a number of enlightened citizens—but of that very same active and unremitting industry, which we wished so much to commemorate. If, nevertheless, the ideas which we have presumed to offer in this place, could awaken the public spirit of some of our well informed men, if they would favor us in some moments of leisure with sketches relative to those objects which lie particularly within the sphere of their activity, or of their immediate observation, we should feel extremely grateful for the benefit.

With regard to that part of the Gleaner which is more particularly devoted tot he department of literature,the Editor is afraid of meeting with no inconsiderable degree of censure. Leaving aside the numberless incorrections arising from the haste of a periodical publication, he dares scarcely expect, that his *taste,* as far as it concerns literature in general, will be always the taste of his readers; and yet, neither can nor will he promise any amendment in this respect. He is far from pretending that *his* taste is the best, or even equally good as that of his critics; but such as it is, it is so much combined with his personality, so much interwoven with his feelings and habits, that any attempt of his, at producing a change in this point, would prove absolutely abortive. He values highly the successful efforts made by American genius in the field of literature, but still he denies firmly, that there is as yet, any such thing among us as a tribunal of criticism, to whose decision any production of the pen may be blindly submitted. Until the authority of such a tribunal can be fairly admitted, a candid comparison with the standard-writers of the English nation, is the only criterion of literary merit; and if the Editor of the Gleaner is fully convinced, that by submitting to this scrutiny, he has no laurels to gather, he flatters himself at least, that he will not be altogether reproved as the very last among his competitors.

There is one particular, however, in which he is willing to admit a want of condescension for the taste of the majority of his readers, viz. the general choice of his subjects. The happy ones are fond of indulging in gaiety and gladness, and those whose minds are occasionally depressed, will often like to be cheered up by the merry tale, and sometimes even by the facetious witticism. If until now the Editor has furnished but little that may satisfy the wishes of these various classes, if his subjects have been mostly grave and sometimes melancholy, he has perhaps too much indulged the state of his own mind.—All his readers are not mourners, and it is his most sincere wish, that few of them may be so. It will be consequently, in future, one of his first concerns, to write for *their* satisfaction, and not for *his own*; and if he cannot bring his mind to yield to the inspirations of joy, he will endeavor to supply the deficiency by appropriate selections.

For the various communications in prose and especially in verse, which have been hitherto received, the Editor returns his warmest thanks. They are few in number, but still they show, that the western sky, though often obscured by mists and overshadowed by clouds, is not inaccessible to the rays of heavenly genius. We hope that our friends will favor us henceforward with their literary productions and by concurring with our feeble efforts, contribute towards the prosperity, the civilization and the glory of their country.

NEW CHEMICAL DISCOVERY.

London, January 20, 1814,

Iode or Violaceous gas.—The Royal Society met after the holidays, when a paper from Sir H. Davy was read, describing a new and important discovery. About two years ago, a Parisian manufacturer of saltpetre, using all kinds of sea-weed as a substitute for barilla, discovered that his vessels were occasionally corroded by a particular substance of a beautiful violet color; he communicated the fact to some Parisian chemists, but

no particular notice was taken of it until Sir H. Davy went to Paris.

This new substance is easily procured by pouring sulphuric acid on the residuum of sea-weed after the carbonate of soda has been extracted. It appears that all the vegetable products of the sea shore, yield it when thus treated. By pouring the acid on the residuary ashes of the sea-weed, this new and most beautiful violet colored gas is obtained.

The French propose calling it *iode* gas [from the Greek word *ion*, violet] but Sir. H. D. prefers the term *violaceous* gas, as most suitable to English phraseology; its combination with hydrogene, he agrees, may be called *hydro-iodie gas*, &c. Its properties are equally important to the scientific chemist and manufacturer as a dye and pigment. It is the heaviest known gas; 100 cubic inches weighing 95. 5 grains; it is easily disengaged at the temperature of 156; at a low one, it condenses into fine violet-colored crystals; it is rapidly absorbed by the metals, uniting with iron, mercury, tin, lead and zinc, and changing them into salts of the most beautiful tints of yellow, orange and brown. It has many analogies with oxygen, the alkalies and chlorine or oxy-muriatic acid; like the alkalies it has great affinity to oxygen, from which it can be expelled by heat; it experiences no change by the action of the voltaic pile, yet rapidly combines with phosphorus, hydrogen and all the muriats; it is a non-conductor, is very slightly combustible, yet it is a supporter of combustion. It is so easily united with all the common metals, and converts them into such fine pigments, that before as many months elapse in this country, after its discovery, as years have done in Paris, it will be prepared by all our color-manufacturers, and used by our cabinet-makers, wood-stainers and dyers. The existence of this substance tends to support an opinion of Sir H. D. that acids and alkalies do not depend on any peculiar acidifying principle, but on certain modifications of matter. All the iodats of iron, zinc, &c. are soluble in ether and spirits of wine, and many of them in water.

A Table of the quantities of soluble or nutritive matters afforded by 1000 *parts of different vegetable substances.*

[IN the Miscellanies of the fifth number of the *Gleaner*, we have given some observations on the average nutriment of different provisions. The following table from Sir Humphrey Davy's treatise on agriculture which we extract from the Emporium will form an interesting addition to the above mentioned article.]

Vegetables or vegetable substances.	Whole quantity of soluble or nutritive matter.	Mucilage or starch	Saccharine matter or Sugar.	Gluten or Albumen.	Extract, or matter rendered insoluble during evaporation
Middlesex wheat, average crop	955	765	—	190	
Spring wheat	940	700	—	240	
Mildewed wheat of 1806	210	178	—	32	
Blighted wheat of 1804	650	520	—	130	
Thick-skinned Sicilian wheat of 1810	955	725	—	230	
Thin-skinned Sicilian wheat of 1810	961	722	—	239	
Wheat from Poland	950	750	—	200	
North American wheat	955	730	—	225	
Norfolk barley	920	790	70	60	
Oats from Scotland	743	641	15	87	
Rye from Yorkshire	792	645	38	109	
Common bean	570	426	—	103	41
Dry peas	574	501	22	35	16
Potatoes	from 260 to 200	from 200 to 155	from 20 to 15	from 40 to 30	
Linseed cake	151	123	11	17	
Red beet	148	14	121	13	
White beet	136	13	119	4	
Parsnip	99	9	90		
Carrots	98	3	95		
Common turnips	42	7	34	1	
Swedish turnips	64	9	51	2	2
Cabbage	73	41	24	8	
Broad-leaved clover	39	31	3	2	3
Long-rooted clover	39	30	4	3	2
White clover	32	29	1	3	5
Sainfoin	39	28	2	3	6
Lucerne	23	18	1	—	4
Meadow fox-tail grass	33	24	3	—	6
Perennial rye grass	39	26	4	—	5
Fertile meadow grass	78	65	6	—	7
Roughish meadow grass	39	29	5	—	6
Crested dog's-tail grass	35	28	3	—	4
Spiked fescue grass	19	15	2	—	2
Sweet-scented soft grass	82	72	4	—	6
Sweet-scented vernal grass	50	43	4	—	3
Fiorin	54	46	5	1	2
Fiorin cut in winter	76	64	8	1	3

All these substances were submitted to experiment green, and in their natural states. It is probable that the excellence of the different articles as food will be found to be in a great measure proportional to the quantities of soluble or nutritive matters they afford; but still these quantities cannot be regarded as *absolutely* denoting their value. Albuminous or glutinous matters have the characters of animal substances; sugar is more nourishing, and extractive matter less nourishing, than any other principles composed of carbon, hydrogen, and oxygen. Certain combinations likewise of these substances may be more nutritive than others.

I have been informed by Sir Joseph Banks, that the Derbyshire miners in winter, prefer oat cakes to wheaten bread; finding that this kind of nourishment enables them to support their strength and perform their labor better. In summer, they say oat cake heats them, and they then consume the finest wheaten bread they can procure. Even the skin of the kernel of oats probably has a nourishing power, and is rendered partly soluble in the stomach with the starch and gluten. In most countries of Europe, except Britain, and in Arabia, horses are fed with barley mixed with chopped straw; and the chopped straw seems to act the same part as the husk of the oat. In the mill 14lbs. of good wheat yield on an average 13lbs. of flour; the same quantity of barley 12lbs. and of oats only 8lbs.

In the south of Europe, hard or thin-skinned wheat is in higher estimation, than soft or thick-skinned wheat: the reason of which is obvious, from the larger quantity of gluten and nutritive matter it contains. I have made an analysis of only one specimen of thin-skinned wheat, so that other specimens may possibly contain more nutritive matter than that in the table.

ORIGINAL POETRY.

FOR THE WESTERN GLEANER.

WHEN wav'ring doubt and gloomy care,
Their phantom horrors o'er me roll;
When hope has fled, and fell despair
Spreads her black mantle on my soul—

Fancy, on airy pinions borne,
Spurns the dark fiends herself has bred;
The halcyon days of life's gay morn
Revives anew, that swiftly fled.

She seeks a fairy smiling band,
In friendship's sacred union bound,
Where wise Minerva's lib'ral hand
Her heav'nly gifts bestrews around.

The muse is here the fav'rite guest,
Whether in stately garb array'd,
Or brow in wreaths of myrtle dress'd
Or "dimpled laugh" adorn the maid.

Here wit her fairest charms displays,
Her darts in poison dipt, detains;
Unconscious beauty's melting rays
Transfix the soul, and forge its chains.

Fir'd by each warm, each fragrant breath,
With life the slender texture glows,*
And see arise a floret wreath,
That in "perennial beauty" blows.

* A favorite occupation of the little circle to which the author alludes, is embroidering on cambric.

But when with each revolving year
The festive natal day returns,
Friendship's pure stream shews crystal clear,
The social flame more brightly burns.

Apollo and the "tuneful nine"
From Pindus' sacred founts descend,
A verdant laureate wreath entwine,
And their divinest influence lend.

Old time admiring, stays his wings
On rosy beds, in myrtle bow'rs;†
Charm'd at the Muses' sight, he sings
Oft shall return these gladsome hours.

And ever in his annual round,
To earth allur'd by scenes like this,
May his prophetic tongue resound
With promises of future bliss.

And oft may he that's far remov'd,
By mem'ry's faithful eye be seen,
For Oh! none more than he has lov'd,
More true, or more devoted been.....C. W.

TO MIDNIGHT.

[The following Stanzas, written by a Lady of the age of seventeen years, have been handed to the editor by a friend of the author.]

OH! Midnight, much I owe to thee,
Bland soother of my infant woes;
In thy blest visions oft I see,
Sweet future moments of repose:

† At an annual celebration of the commencement of the society, celebrated a few months since, among other original poetry, a few beautiful lines, promising a frequent return of such happiness as was then enjoyed, were placed in the hand of a figure of Time, which was surrounded by myrtle and roses.

In early life, when fancy rose,
Dim dawning from my opening mind,
From thee I caught the brightest glows,
Thou all my soul to song refin'd.

Oft when the world was laid in sleep,
And yonder morn rose in the sky—
I wak'd with thee to *watch* and *weep*,
And seize the sweets of poesy:
And yet the tear that fill'd mine eye,
Was clearer than when in the bower
Of some gay beauty fair and high,
My heart was right in pleasure's power.

When first my feeble hand essay'd
To touch the varied flow of song,
Trembling, I sought thy ebon shade,
And *bade* thy breeze the tones prolong;—
For sometimes were they rude and strong,
And often weak and faint they fell,
But Oh!—the hand that swept along,
Felt all their soothing force too well.

When far I stray'd from that lov'd land,
Where ev'ry cherish'd hope was laid,
My note of woe on unknown strand,
To thee dear Midnight still was paid.
The wild-flow'rs of my song may fade,
If friendship's heart rejects their bloom,
But thou, in starry robe array'd,
I'll love till shelter'd in the tomb.

The chill embrace of ruthless death,
That robs my bosom of life's glow,
Shall not prevent my fleeting breath,
For thee Oh Midnight lov'd to flow.
To thee, dark Empress, all I owe,
Then take my latest song and sigh,
When ends my pilgrimage of woe,
I'll, like you, *taper*, *blaze* and *die*.....MARIA.

SELECTED POETRY.

From the Rural Visiter.

THE TULIP AND THE ROSE.

AS Lucy chanc'd an April day,
Along the wild parterre to stray,
Where many a flow'r of brilliant hue,
In gay profusion rose to view,
She stopt to gaze:—her roving eyes
Had rested on a tulip's dyes,
That proudly wav'd above the rest
In youthful pride its sparkling breast:
And near—a rose-bud gemm'd with dew,
In bashful beauty blooming grew.

Her gaudy form the tulip roll'd
In heav'nly blue, bedropt with gold,
And o'er her bosom's milky snows
The rosy beams of morning throws;
Brightest of flow'rs—she stood confess'd,
The empress of the dreary waste.
In gentle gales the rose-bud plays,
And lovelier blush'd at every gaze,
And from its fragrant bosom threw
Perfume and pleasure where it grew.

Lost in suspense, the gazing maid
Their rival beauties long survey'd—
Delightful flow'er! she cry'd, and press'd
The blushing rose-bud to her breast.

From the Rural Visiter.

THE VOW.

BY Delia's lips of rosy hue,
By Delia's eyes of melting blue,
I've vow'd to be forever true,
And I will ne'er deceive thee:—

But lest my vows, in years decay,
Or with thy roses melt away,
And Delia rue the fatal day,
I taught her to believe me :—

By thy pale cheek's retiring dye,
By thy lov'd bosom's latest sigh,
By the last tear-drop of thine eye,
Be thus my vows extended.

Nor till that long eternal day,
When death bids all my hopes decay,
Or tears me from thine arms away,
These holy vows be ended.

THE HARP OF SORROW.

By James Montgomery.

I GAVE my harp to sorrow's hand,
And she has rul'd the chords so long,
They will not speak at my command;
They warble only to HER song.

Of dear departed hours,
Too fondly loved to last,
The dew, the breath, the bloom of flowers,
Snapt in their freshness by the blast.

Of long, long years of future care,
Till lingering nature yield her breath,
And endless ages of despair,
Beyond the judgment-day of death.

The weeping minstrel sings,
And while her numbers flow,
My spirit trembles with the strings,
Responsive to the notes of woe.

Would gladness move a sprightlier strain,
And wake the wild Harp's clearest tones;
The chords, impatient to complain,
Are dumb, or only utter moans.

And yet to sooth the mind
With luxury of grief,
The soul to suffering all resign'd
In Sorrow's music finds relief.

Thus o'er the light Aeolian lyre,
The winds of dark November stray,
Touch the quick nerve of every wire,
And on its meager pulses play;....

Till all the air around
Mysterious murmurs fill,
A strange bewildering dream of sound,
Most heavenly sweet.....yet mournful shrill.

O! snatch the Harp from Sorrow's hand,
Hope! who hast been a stranger long;
O! strike it with sublime command,
And be the Poet's life thy song.

Of vanished troubles sing,
Of fear for ever fled,
Of flowers that hear the voice of spring,
And burst and blossom from the dead;....

Of home, contentment, health, repose,
Sincere delights, while years increase;
And weary life's triumphant close
In some calm sunset-hour of peace.

Of bliss that reigns above,
Celestial May of youth,
Unchanging as Jehovah's love,
And everlasting as his truth;

Sing, heavenly Hope! and dart thine hand
O'er my frail Harp, untun'd so long;
That Harp shall breathe, at thy command,
Immortal sweetness through thy song.

Ah! then this gloom controul,
And at thy voice shall start
A new creation in my soul,
A native Eden in my heart.

THE

WESTERN GLEANER,

OR

Repository

FOR

ARTS, SCIENCES AND LITERATURE.

UTILE DULCI.—*Hor.*

VOL. I.

PITTSBURGH,

PUBLISHED BY CRAMER, SPEAR AND EICHBAUM,

FRANKLIN HEAD, MARKET STREET.

Robert Ferguson & Co. Printers.

1814.

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